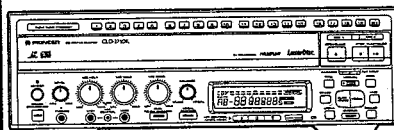


Service Manual

PIONEER®
The Art of Entertainment



ORDER NO.
ARP2545

CD CDV LD PLAYER

CLD-2710K

CLD-2710K HAS THE FOLLOWING:

Type	Power Requirement	Remarks
RD	AC110 - 127V, 220 - 240V (switchable)	

- This manual is applicable to CLD-2710K/RD.

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1. DISASSEMBLY

1. Disc Tray

- ① Turn the power switch on and press the OPEN button then pull the tray out from the player.
- ② Remove two tray stopper screws (A).
- ③ Pull out the tray toward the front.

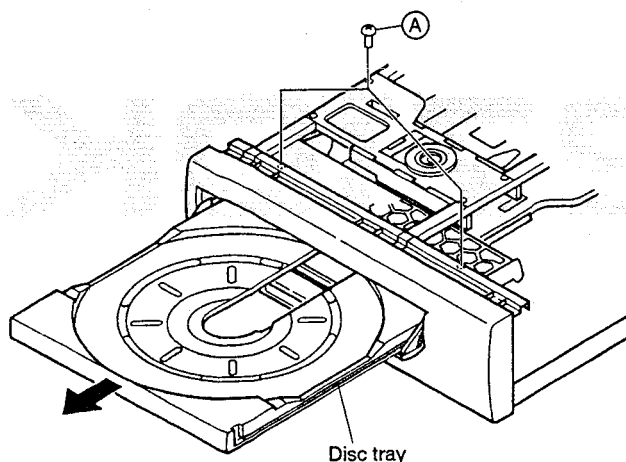


Fig. 1

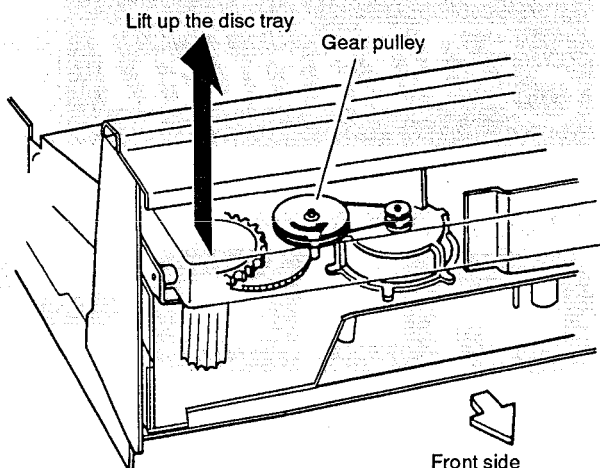


Fig. 3

2. Clamper Assembly

- ① Remove four screws (A) to remove the clamper assembly.

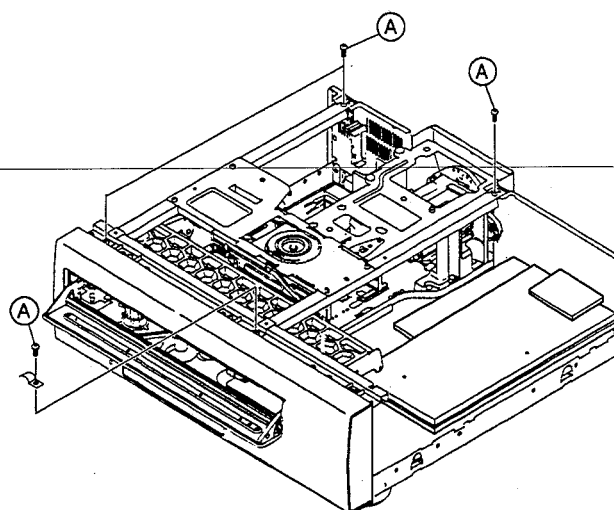


Fig. 4

Note 1: How to open the tray by hand

- ① Remove two screws (A) for tray stopper. (Fig. 1)
- ② Remove the front panel. (by loosening three screws at the top side and a fixing screw of the earth lead.)
- ③ Remove two fixing screws from the slide cam on the left side. (Fig. 2)
- ④ Lift up the front side of the disc tray to enable the gear pulley to be turned by hand. (Fig. 3)
- ⑤ Turn the gear pulley (Fig. 3) counterclockwise by hand.
- ⑥ After the disc tray is lifted up and moved toward you, tighten two screws (B) which were removed in step 3.
- ⑦ Pull out the disc tray toward you by hand.

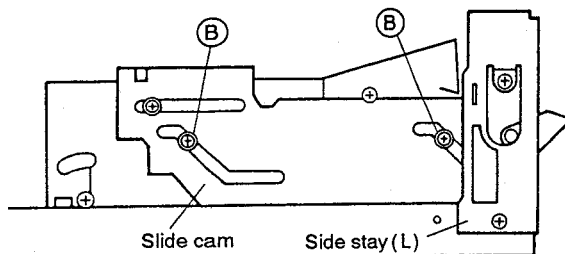


Fig. 2

3. Carriage Assembly

- ① Slide the carriage assembly to the shaft of the turn plate by hand.

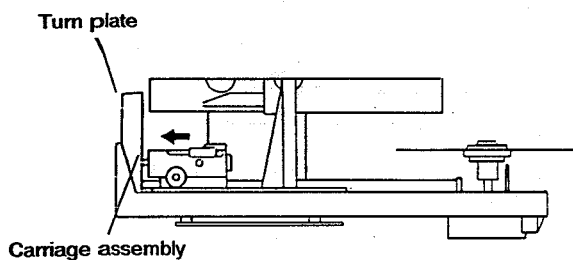


Fig. 5

- ② Disconnect two connectors ② and ③ from the CNNB assembly to remove the flexible cable (Fig. 6).
- ③ Remove six screws ① from the post (L) and (R) to remove the tilt base.
- ④ Pull out the carriage assembly by setting the tilt base (upper) toward the upper (Fig. 7).
- ⑤ Unhook two stoppers and remove a SW.

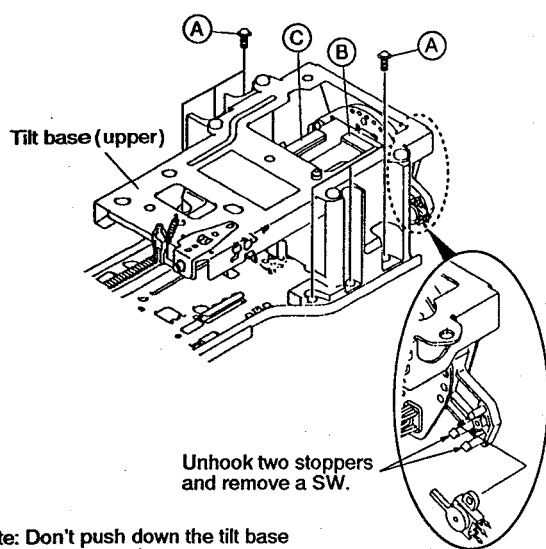


Fig. 6

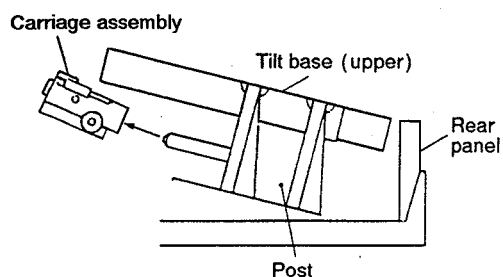


Fig. 7

- How to replace the flexible cable

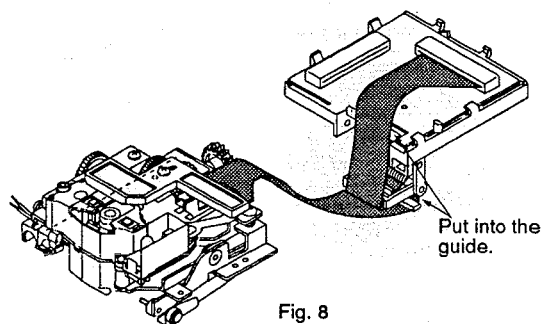


Fig. 8

4. KAUB Assembly

- ① Open the tray.
- ② Remove one screw ①, two screws ② and three screws ③.
- ③ Separate the output terminal of the KAUB Assembly from the rear panel. (Arrow ①)
- ④ Slide the KAUB Assembly by lifting it up. (Arrow ②)
- ⑤ Raise the KAUB Assembly so that it does not touch the tray guide assembly. (Arrow ③)

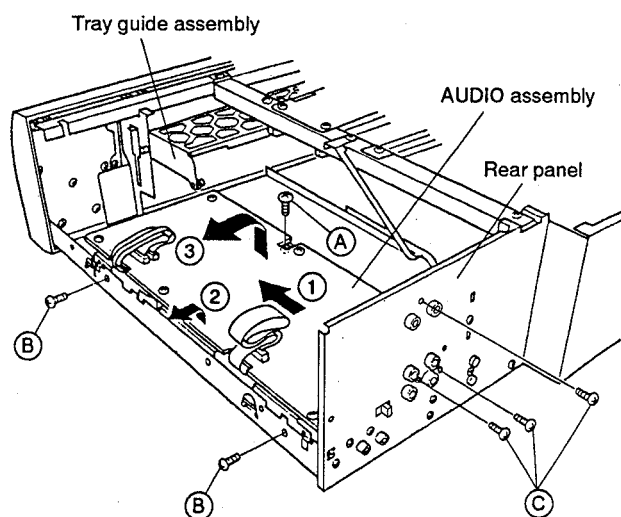


Fig. 9

5. How to install the cam gear

- ① Grease the cam gear. (Fig. 10)

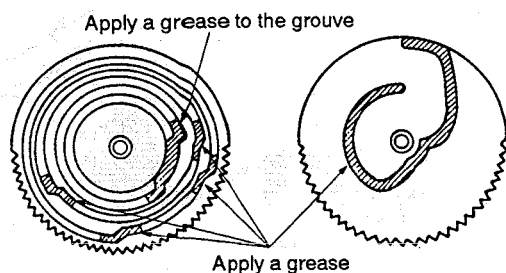


Fig. 10

- ② Move switch levers ① and ② (Fig. 11) in the direction of arrow ① (SW is ON), switch lever ③ in the direction of arrow ② and lever ④ in the direction of arrow ③.

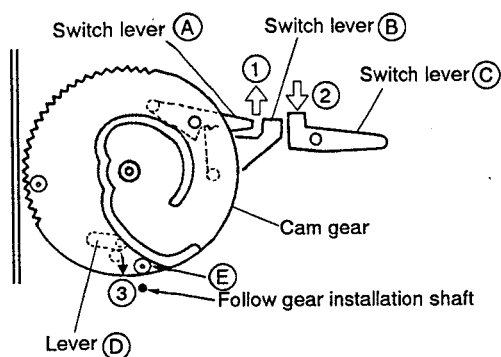


Fig. 11

- ③ Install the cam gear in the position where projection ⑤ of the cam gear comes to the front of the follow gear installation shaft..

6. How to install the spring slanting cam

- ① Grease the spring slanting cam. (Fig. 12)
- ② Install the cam gear when the cam gear comes to the position as shown in Fig. 11.

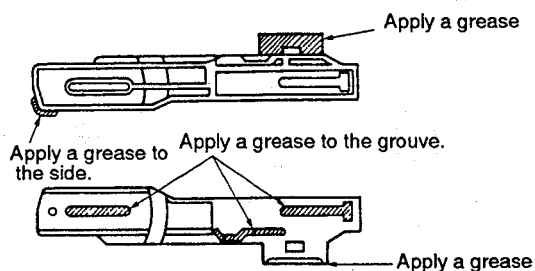


Fig. 12

- ③ Install a nylon washer and an E ring, and hang the cam spring on the hook. (Fig. 13)

Note: The cam gear and spring slanting cam as shown in Fig. 13 are positioned when installing the slide cam.

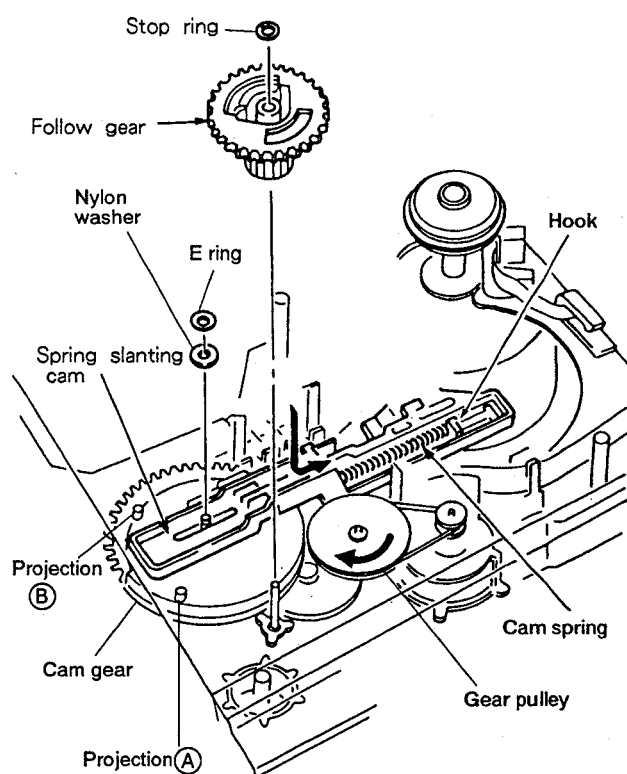


Fig. 13

7. How to install the follow gear

- ① Grease the follow gear. (Fig.14)

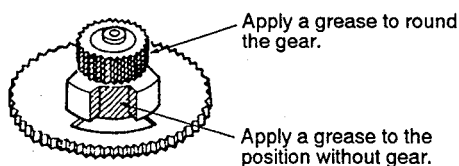


Fig. 14

- ② Install the follow gear where the portion of chipped tooth of the follow gear come to the position as shown in Fig. 15.

- ③ Install the stop ring. (Fig.13)

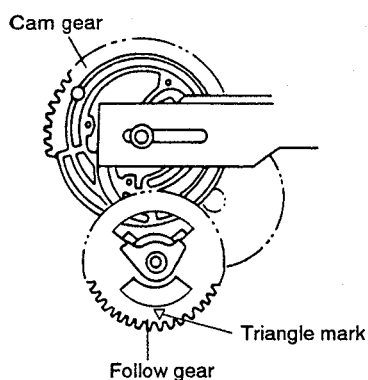


Fig. 15

8. How to install the roller plate assembly

- ① Mount the roller plate assembly in the position where the tooth with a triangle mark of the follow gear meshes with the gap of the gear of the roller plate assembly. (Fig.16)

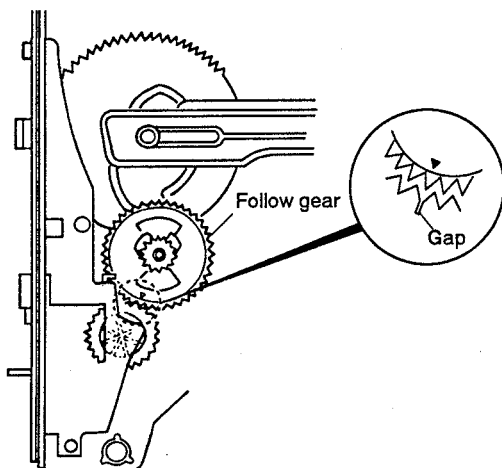


Fig. 16

9. Caution for installing the tray guide assembly

- ① Install the tray guide assembly in the position where projection A of the tray guide assembly fits into the long hole B of the chassis assembly and the long hole C of the roller plate assembly. (Fig.17)

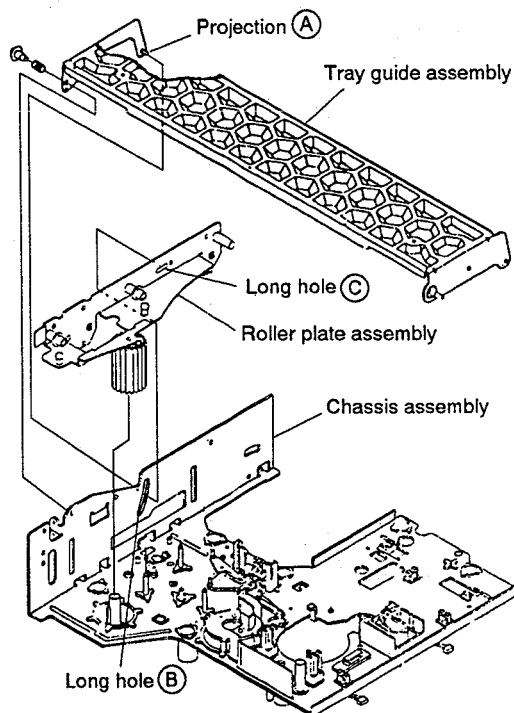


Fig. 17

10. How to install the slide cam

- ① Set the position of projection A and B of the cam gear by turning the gear pulley clockwise by hand as shown in Fig.13.
- ② Tighten four screws C to install the slide cam. (Fig. 18)

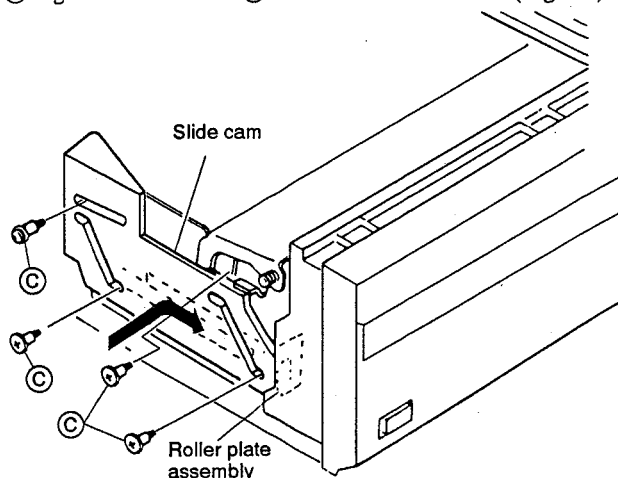


Fig. 18

11. How to install the disc tray

- ① Adjust the gear positions in the loading mechanism for the disc tray open status, as ㉓ and ㉔ mentioned below.
 - ㉓: The position where the cam gear turns counter-clockwise and stops when the OPEN/CLOSE button is pressed.
 - ㉔: The position where the cam gear stops when the pulley is continuously turned by hand.
- ② The top of one of the gear teeth of the roller plate assembly has been chipped off. Finely adjust the position of this chipped tooth by turning the gear counterclockwise so that the tooth comes halfway on the roller plate line.(Fig.19)

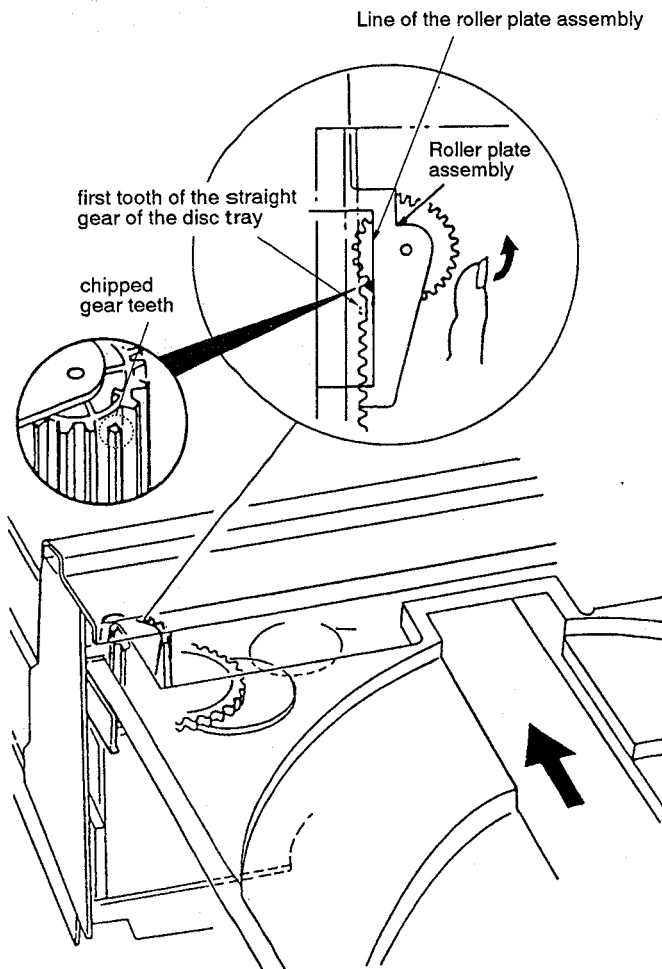


Fig. 19

- ③ Insert so that the first tooth of the straight gear on the rear of the disc tray meshes with the chipped gear teeth of the roller plate assembly.
- ④ Tighten two screws ㉕ for disc tray stopper. (Fig.1)

12. Power Supply Board Assembly

- ① Insert a screwdriver into the chassis hole near a strain relief through the back of the base chassis and remove the strain relief stop ring.

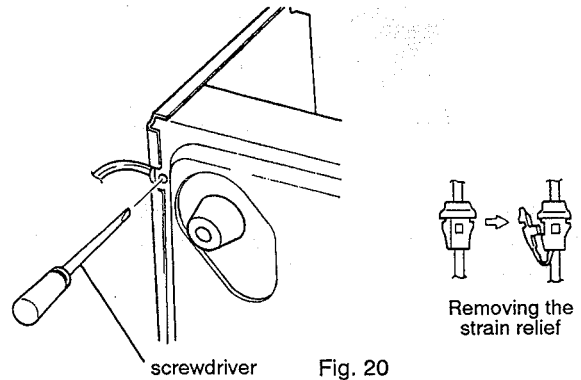


Fig. 20

- ② Remove four screws ㉖ and raise the power supply board assembly. Then the power supply board assembly can be diagnosed for component replacement through the foil side.

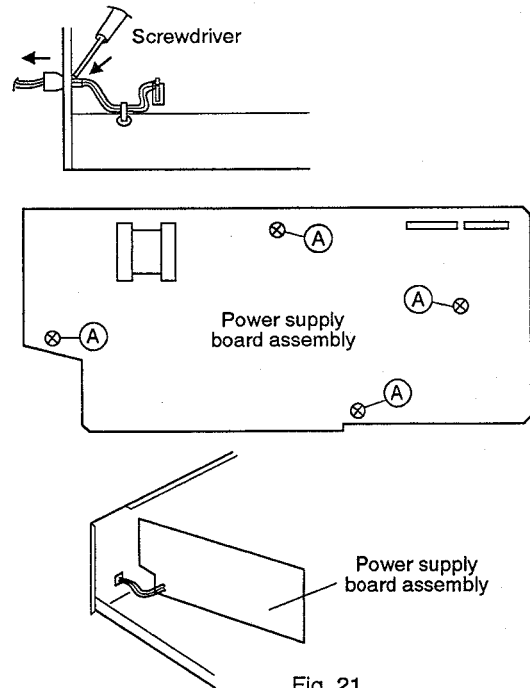


Fig. 21

2. EXPLODED VIEWS AND PARTS LIST

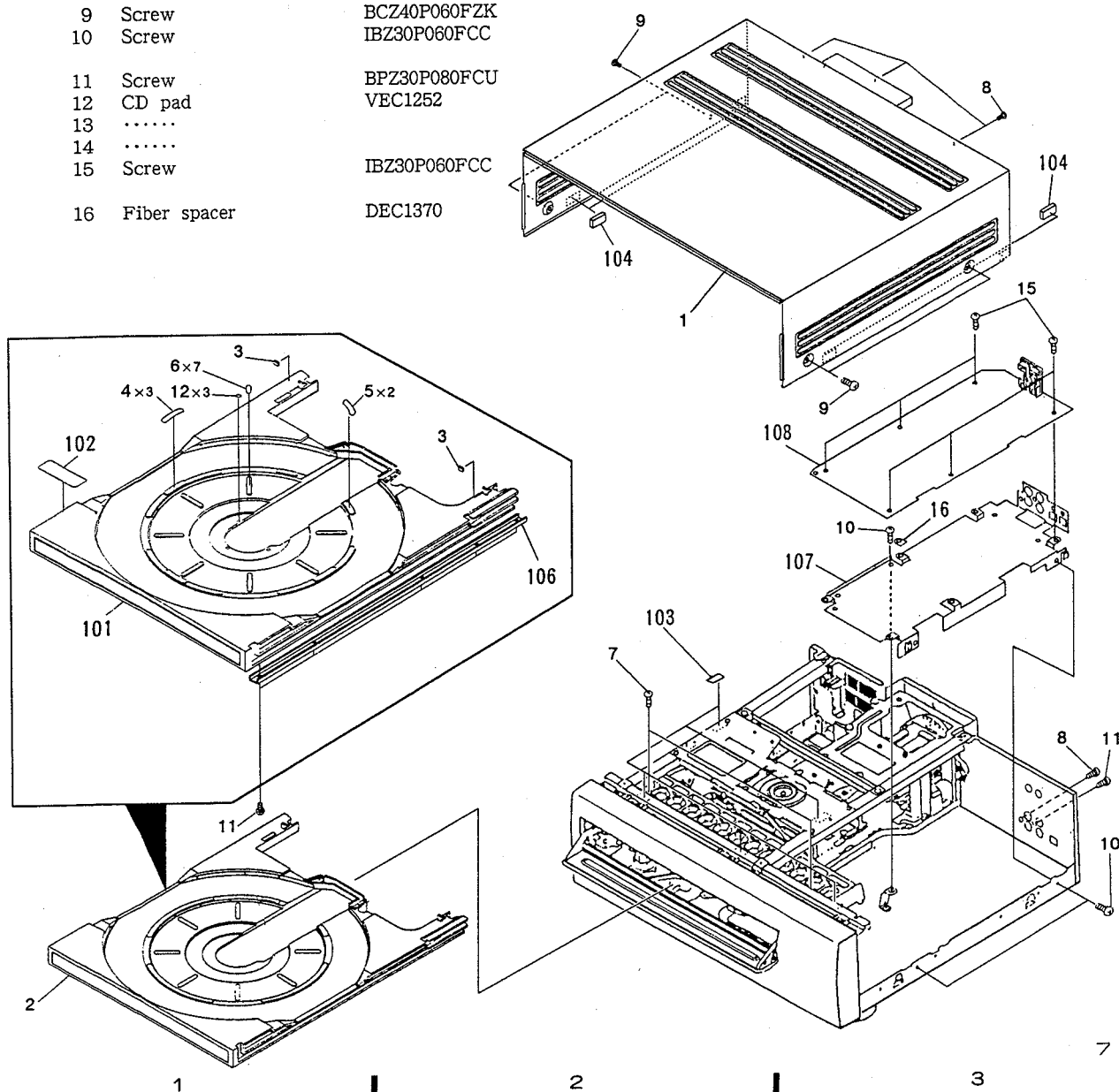
NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The $\triangle$ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

(1) EXTERIOR SECTION

Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Bonnet - S	VXX1535	NSP	101	Tray	VNK1672
	2	Tray assembly - S	VXX1707	NSP	102	Carry label	VRW1289
	3	Tray rubber	VEB1089	NSP	103	Cushion	VEC1092
	4	Disc pad (L)	VEC1191	NSP	104	Cushion	VEC1004
	5	Disc pad (B)	VEC1379		105	.....	
	6	Disc pad (C)	VEC1380	NSP	106	Reinforced plate	VNE1679
	7	Screw	VCZ30P120FMC	NSP	107	PCB holder (A)	VNE1771
	8	Screw	BBT30P060FCC	NSP	108	KAUB assembly	VWV1257
	9	Screw	BCZ40P060FZK				
	10	Screw	IBZ30P060FCC				
	11	Screw	BPZ30P080FCU				
	12	CD pad	VEC1252				
	13	.....					
	14	.....					
	15	Screw	IBZ30P060FCC				
	16	Fiber spacer	DEC1370				



(2) FRONT PANEL SECTION

Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Front panel assembly - S	VXX1778		26	.....	
	2	Door assembly - S	VXX1777		27	Select button assembly	VXA1880
	3	FL panel	VNK1980		28	Snap plate	VNE1102
	4	FL filter	VNK1855		29	LED spacer	VEB1173
	5	Door plate	VNE1482		30	Screw	BPZ26P060FCU
					31	Screw	BPZ26P080FMC
	6	Door damp rubber	VEB1141				
	7	Sub panel (W)	VNK1863	NSP	101	IRKB assembly	VWG1349
	8	Key control button	VNK2114		102	.....	
	9	Door spring	VBH1193	NSP	103	HEPB assembly	VWV1267
	10	Screw	BPZ26P060FCU	NSP	104	MIJB assembly	VWV1266
				NSP	105	Insulation sheet	VEC1465
	11	Screw	IPZ26P060FMC				
	12	PW button	VNK2113	NSP	106	CNCB assembly	VWG1352
	13	Plastic rivet	VEC - 143	NSP	107	FLKB assembly	VWG1347
	14	Back panel (L)	VNK1864	NSP	108	DIKB assembly	VWG1348
	15	Back panel (R)	VNK1865	NSP	109	KCKB assembly	VWG1350
				NSP	110	Front door assembly	VXA1879
	16	Screw	BPZ20P040FZK				
	17	Ten key (A)	VNK2110	NSP	111	Jack holder (S)	VNE1643
	18	Ten key (B)	VNK2111	NSP	112	Jack holder (L)	VNE1644
	19	Damper assembly	VXA1053	NSP	113	Shield sheet	VEF1039
	20	Change knob	VNK1862	NSP	114	Insulation sheet B	VEC1499
				NSP	115	Name plate	VAM1023
	21	Vocal button assembly	VXA1694				
	22	VOL knob (S)	VNK1857				
	23	VOL knob (L)	VNK1858				
	24	HP knob	VNK1920				
	25	.....					

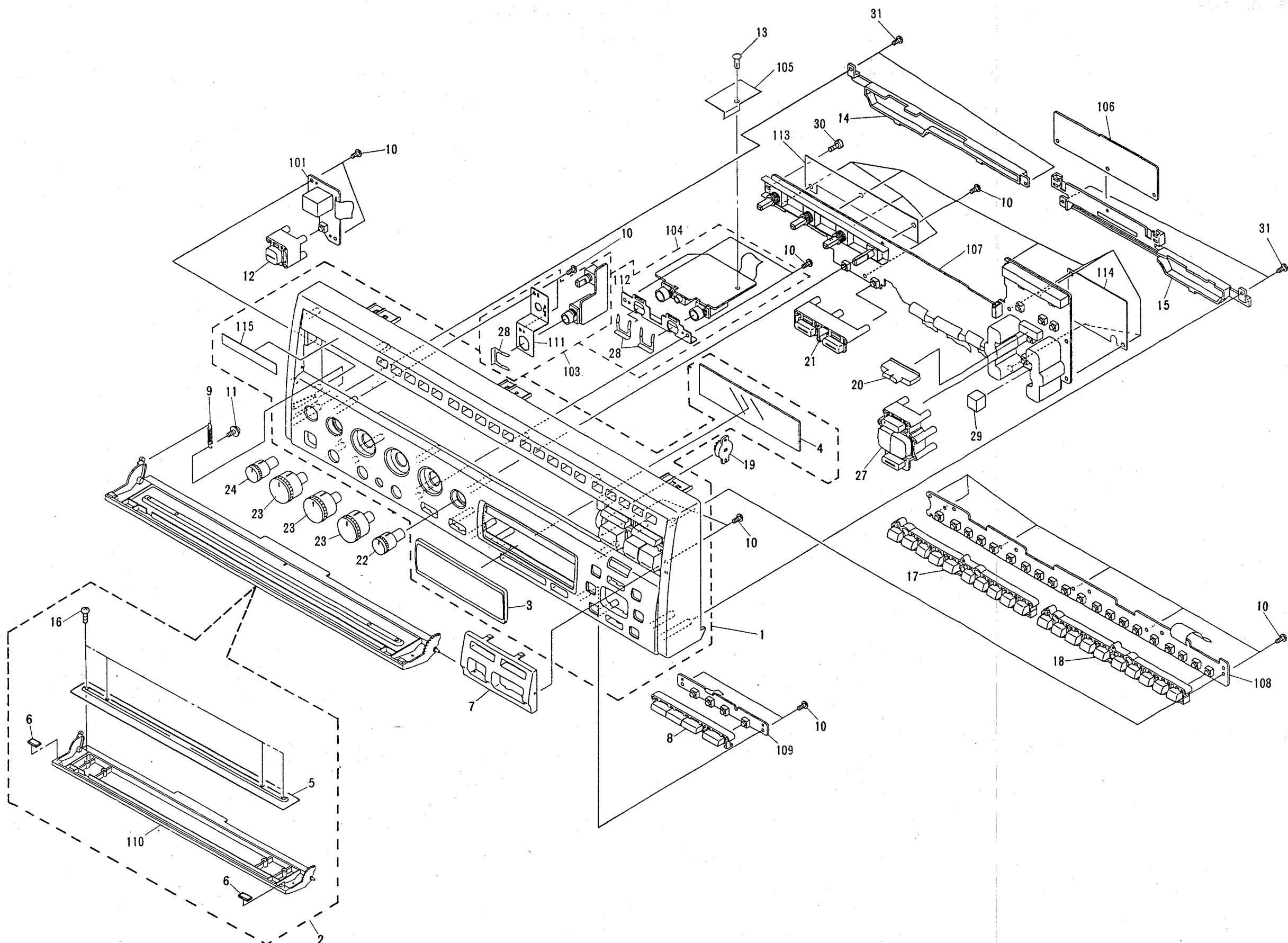
Front Panel Section

A

B

C

D



A

B

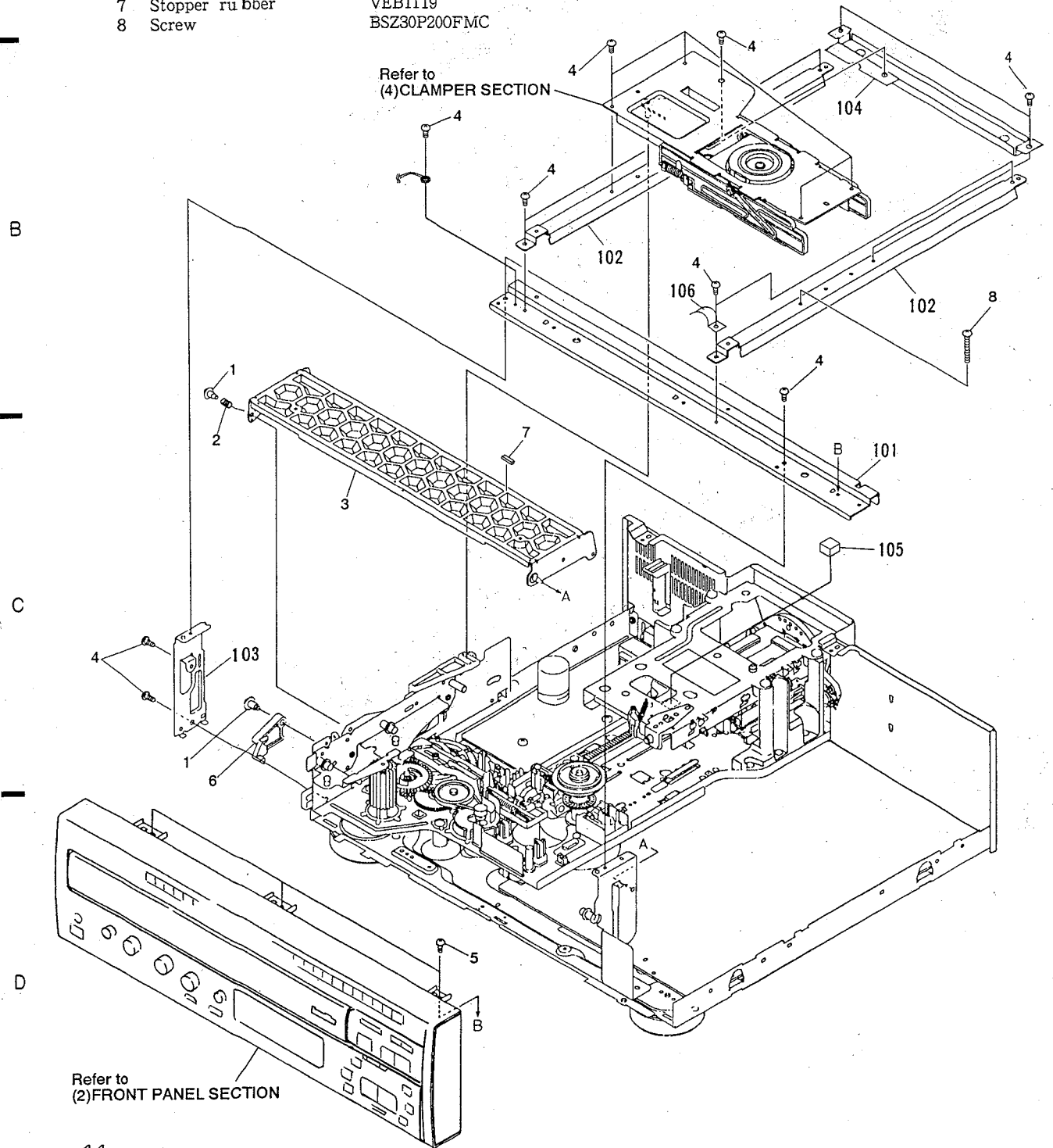
C

D

(3) TOP VIEW SECTION

Parts List

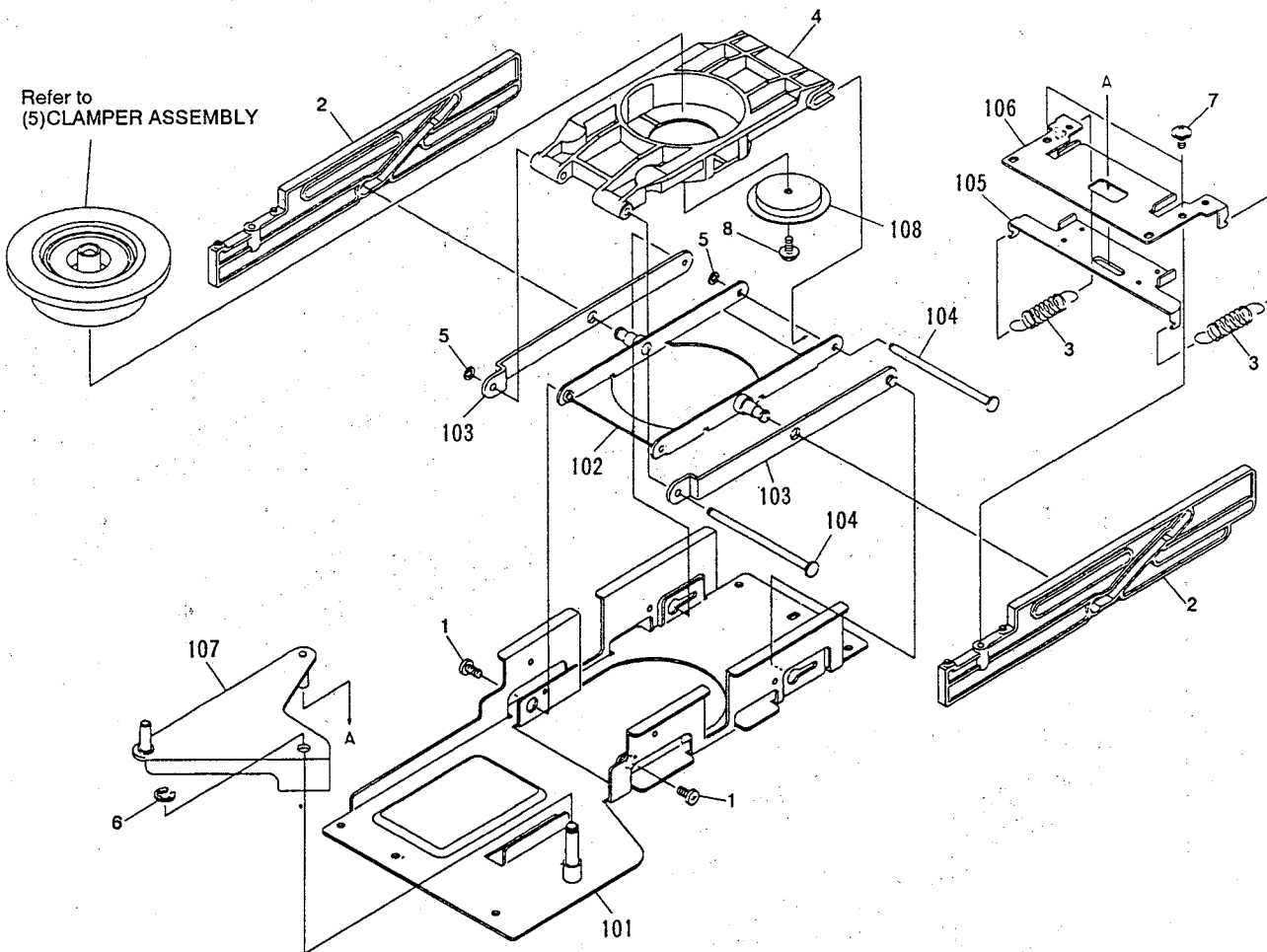
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
A	1	Screw (B)	VBA1008	NSP	101	Front angle	VNE1543
	2	Arm spring	VBH1093	NSP	102	Center angle	VNE1761
	3	Tray guide assembly	VXA1576	NSP	103	Side stay (L)	VNE1545
	4	Screw	BBZ30P060FCC	NSP	104	Reinforced angle	VNE1673
	5	Screw	IBZ30P060FCC	NSP	105	Damp cushion	VEC1602
	6	Door lever (W)	VNL1398	NSP	106	Earth plate	VNE1518
	7	Stopper rubber	VEB1119				
	8	Screw	BSZ30P200FMC				



(4) CLAMPER SECTION

Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Pivot screw	VBA1022	NSP	101	Center plate assembly	VXA1506
	2	Clamp cam	VNL1527	NSP	102	Lever (B) assembly	VXA1504
	3	Limiter spring	VBH1168	NSP	103	Lever (A) assembly	VXA1503
	4	Clamper holder	VNL1305	NSP	104	Clamp shaft	VLL1299
	5	Washer	WT26D060D050	NSP	105	Limiter plate	VNE1551
	6	E ring	YE40FUC	NSP	106	Slide plate	VNE1556
	7	Screw	IPZ30P060FMC	NSP	107	Lever (C) assembly	VXA1505
	8	Screw	PMB30P080FMC	NSP	108	Clamper head	VNE1546



(5) CLAMPER ASSEMBLY**Parts List**

Mark	No.	Description	Part No.
A	1	Magnet assembly - S	VXX1475
	2	Disc clamper	VNL1362
	3	Clamper spring	VBH1153
	4	Clamper base	VNL1364
	5	Centering hub (B)	VNL1435
	6	Steel ball	VNX1006
	7	Centering spring (B)	VBH1130
	8	Clamper cover	VNL1363
	9	Screw	AMZ20P040FMC
	10	Washer	WA60F115M160

Mark	No.	Description	Part No.
NSP	101	Magnet	VMG1010
NSP	102	Gap sheet	VEC1561
NSP	103	Clamper plate	VNE1549
NSP	104	Absorber rubber (A)	VEB1146

B

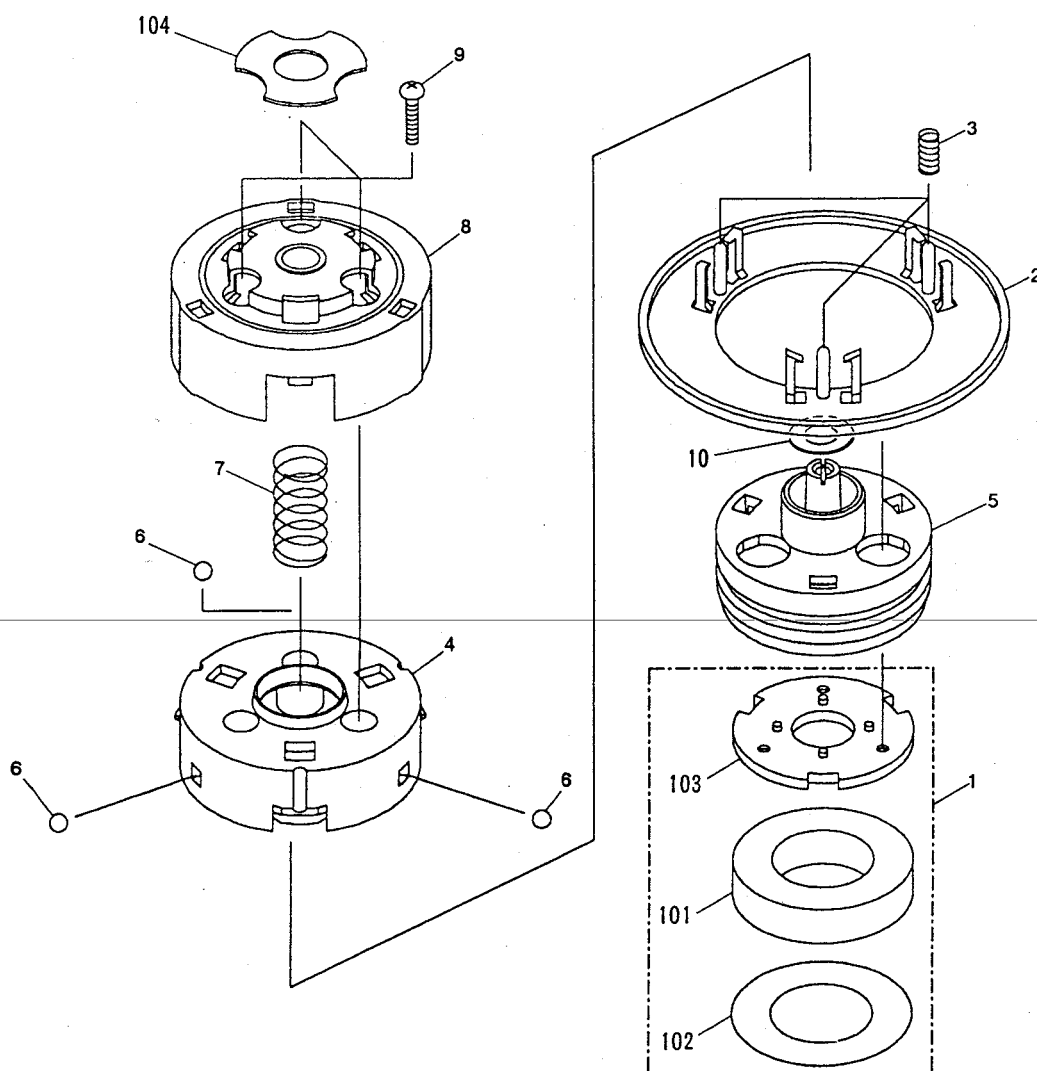
B

C

C

D

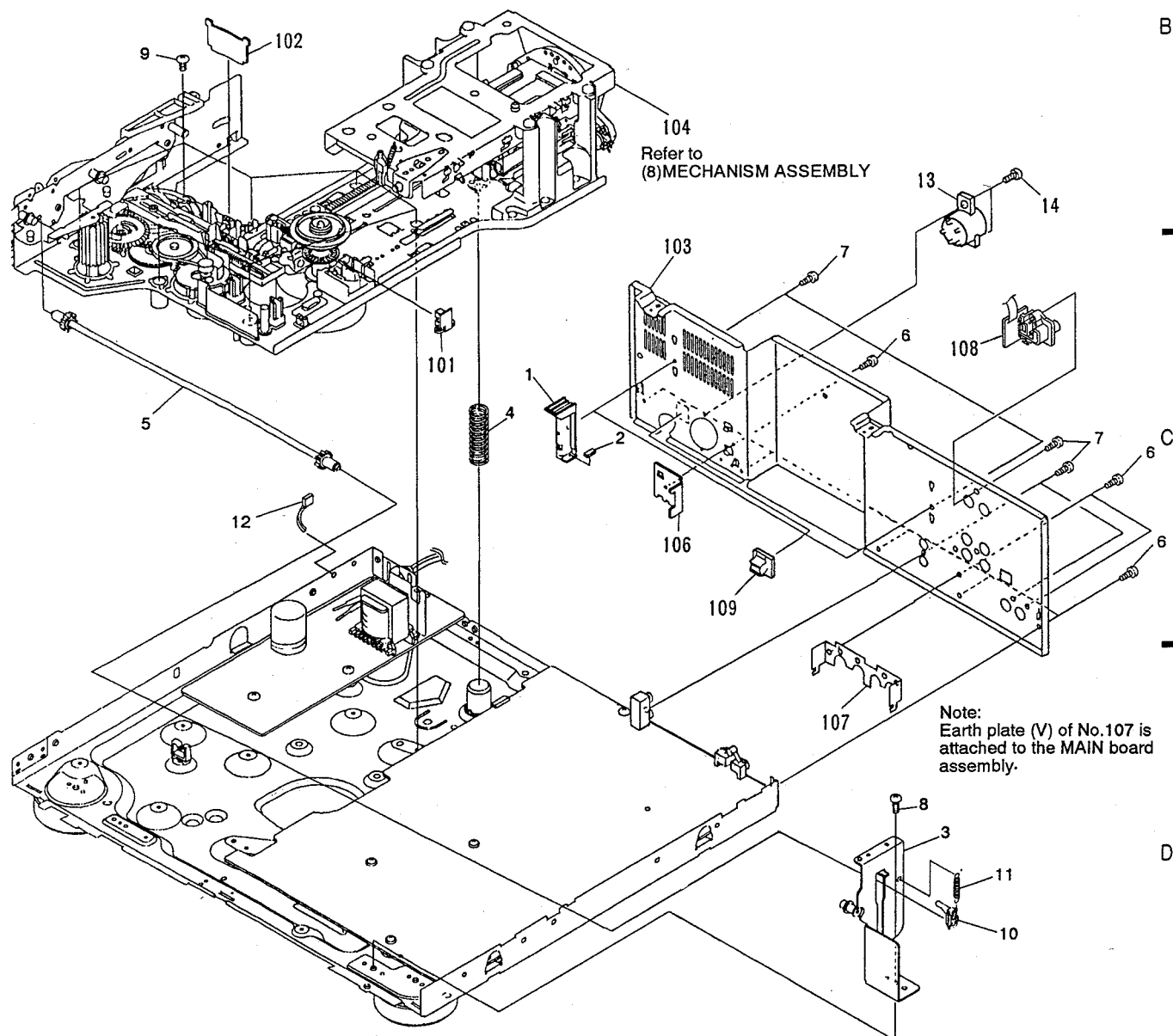
D



5) BASE SECTION [1]

Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Tray stopper	VNL1202	NSP	101	FG board assembly	VWG1286
	2	Door damp rubber	VEB1033	NSP	102	SW board assembly	VWG1287
	3	Side stay (R) assembly	VXA1690	NSP	103	Rear panel	VNA1279
	4	Base spring	VBH1145	NSP	104	Mechanism assembly	VWT1074
	5	Synchro gear assembly	VXA1627		105	.....	
	6	Screw	BBT30P060FCC	NSP	106	TB holder	VNE1612
	7	Screw	BPZ30P080FCU	NSP	107	Earth plate (V)	VNE1788
	8	Screw	BBZ30P060FCC	NSP	108	EXTB assembly	VWG1353
	9	Screw (B)	VBA1023	NSP	109	Wire clamp	VEC1237
	10	Synchro holder	VNL1334				
	11	Synchro spring	VBH1139				
	12	Binder	VEC - 067				
	13	Voltage selector	VSB1004				
	14	Screw	BBZ30P080FCC				



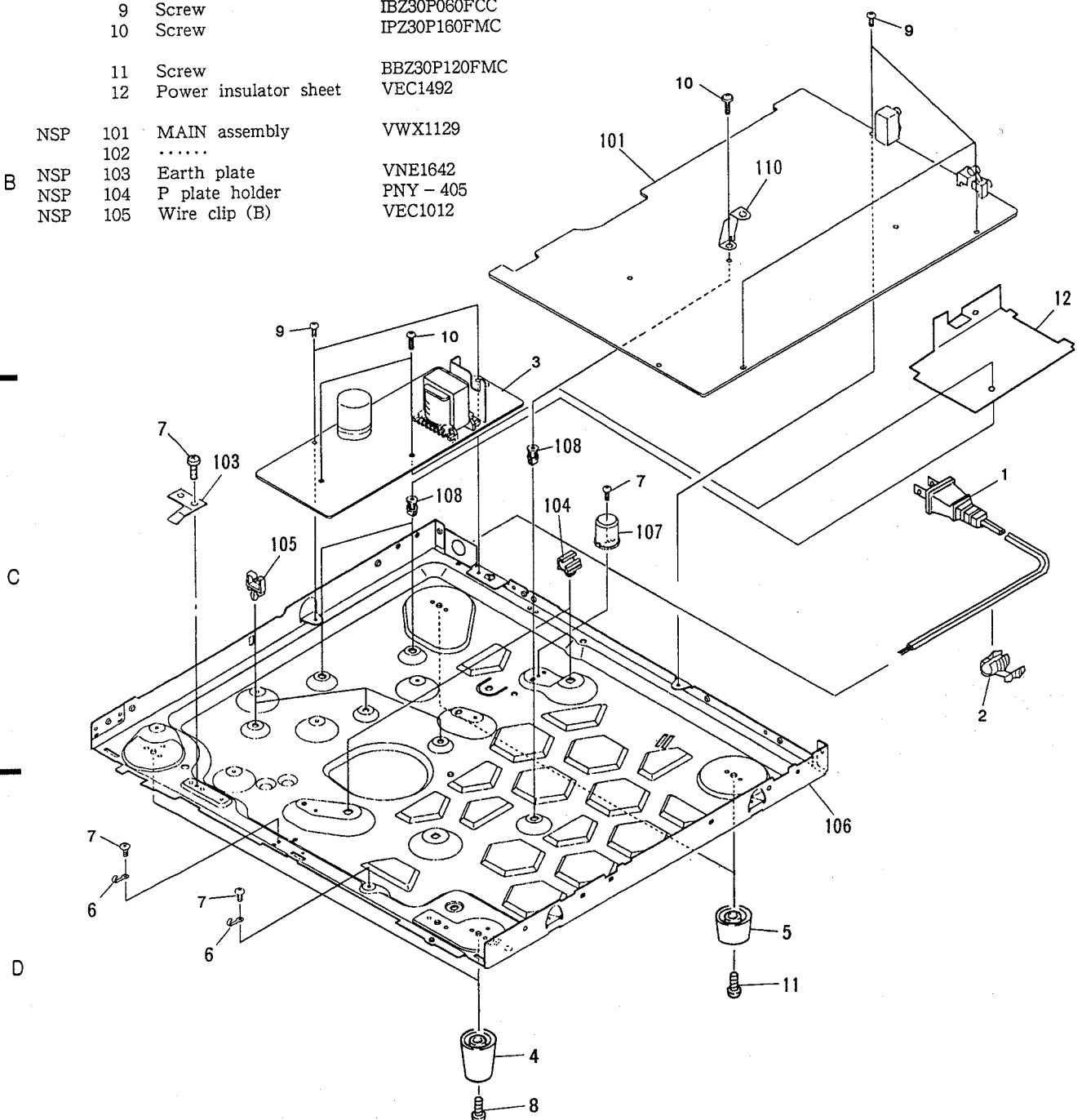
(7) BASE SECTION [2]

Parts List

A

Mark	No.	Description	Part No.
⚠	1	AC power cord	PDG1013
⚠	2	Strain relief	CM - 22B
⊙	3	Power supply board assembly	VWR1132
	4	Insulator assembly	VXA1660
	5	Insulator assembly	VXA1661
	6	Code holder	VNF - 069
	7	Screw	BBZ30P060FCC
	8	Screw	BBZ30P180FMC
	9	Screw	IBZ30P060FCC
	10	Screw	IPZ30P160FMC
	11	Screw	BBZ30P120FMC
	12	Power insulator sheet	VEC1492
NSP	101	MAIN assembly	VWX1129
	102	.....	
B	NSP	103	Earth plate
	NSP	104	P plate holder
	NSP	105	Wire clip (B)

Mark	No.	Description	Part No.
NSP	106	Base chassis	VNA1226
NSP	107	Spring guide	VNL1343
NSP	108	PCB spacer	PNY - 404
	109	.....	
NSP	110	PCB holder (B)	VNE1772



D-2710K

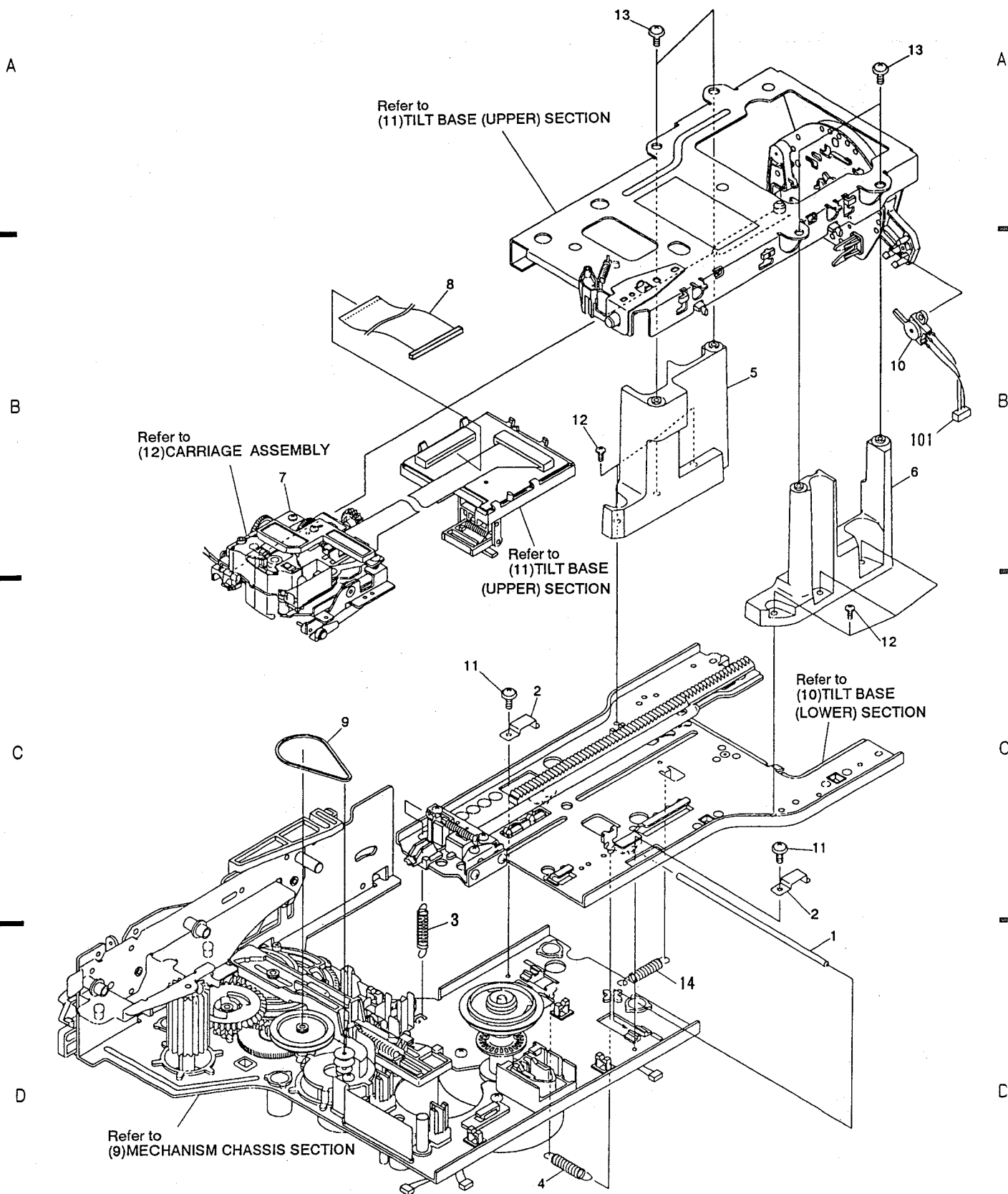
(8) MECHANISM ASSEMBLY

Parts List

Mark	No.	Description	Part No.
	1	Tilt shaft	VLL1326
	2	Plate spring	VBK1013
	3	Tilt spring	VBH1146
	4	Thrust spring	VBH1163
	5	Post (L)	VNL1489
	6	Post (R)	VNL1488
⊙	7	Carriage assembly	VWT1068
	8	Flexible cable (22P)	VDA1329
	9	Belt	PEB1013
	10	Lever switch (TURN SW)	DSK1003

Mark	No.	Description	Part No.
	11	Screw	ABZ26P050FMC
	12	Screw	IBZ30P100FMC
	13	Screw	IPZ30P100FCU
	14	Radial spring	VBH1164
NSP	101	Housing assembly (3P)	VKP1937

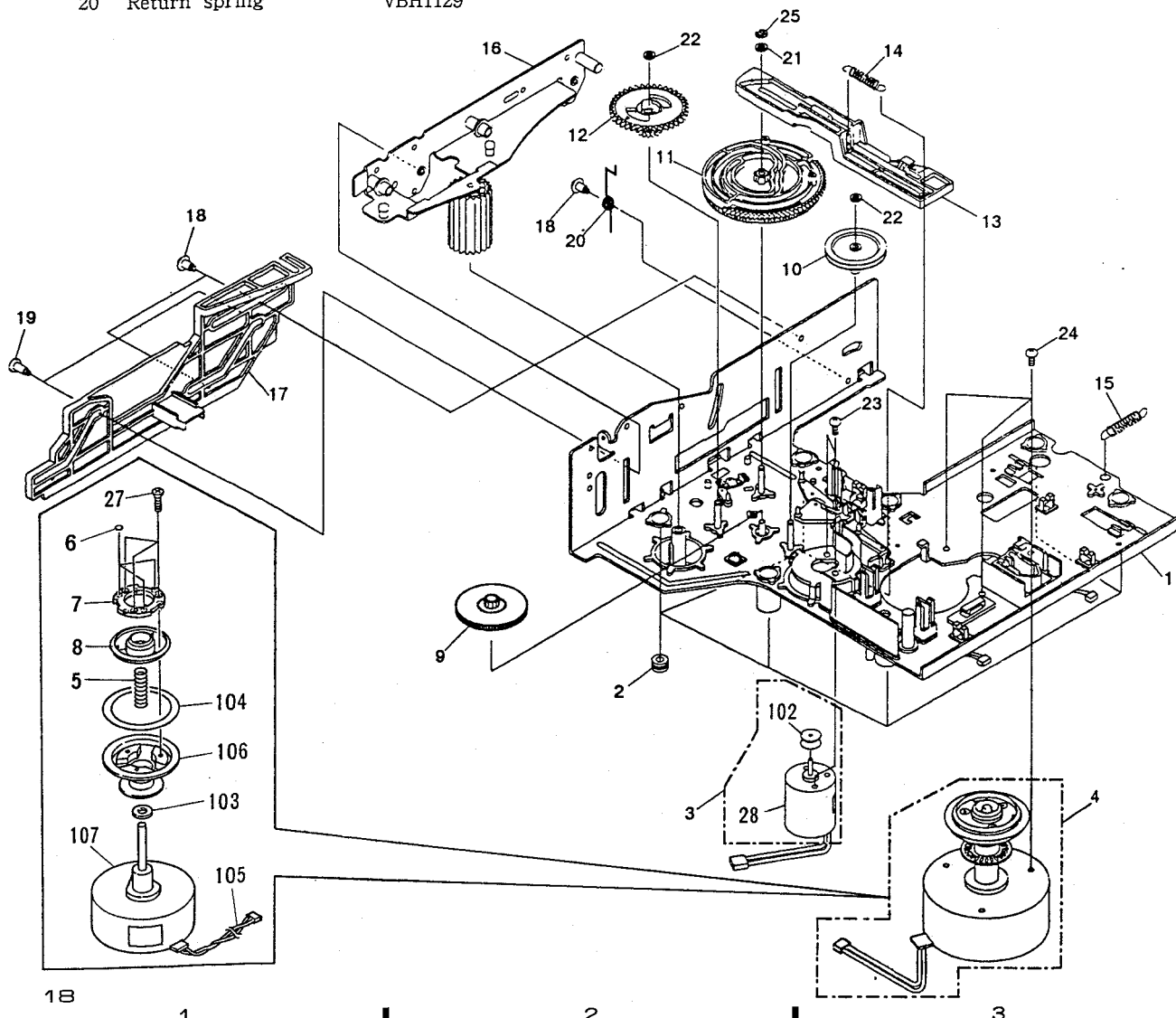
Mechanism Assembly



9) MECHANISM CHASSIS SECTION

Parts List

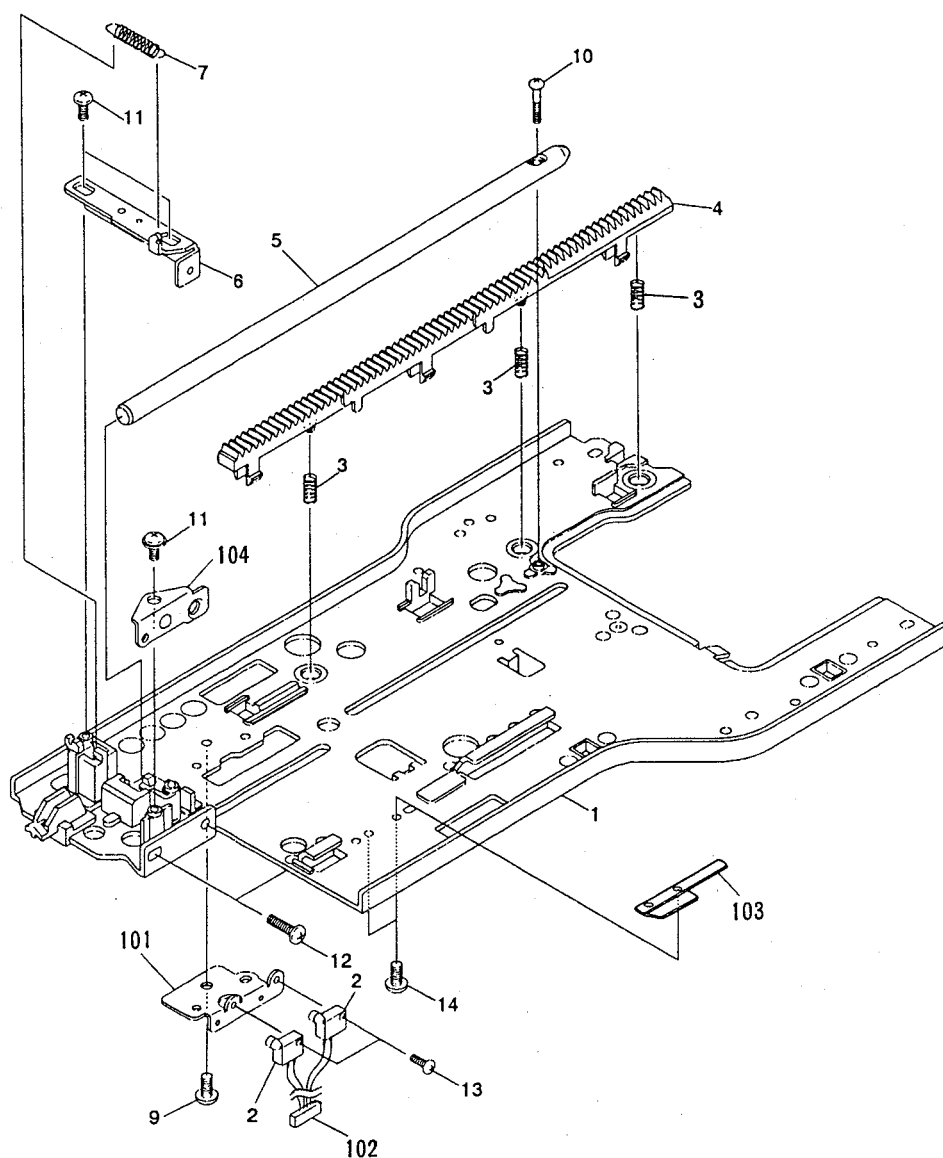
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
D	1	Chassis assembly	VXA1577		21	Nylon washer	WA32N080W050
	2	Rubber bushing	VEB1138		22	Washer	WT26D047D025
	3	Loading motor assembly	VXX1262		23	Screw	PMZ30P040FCU
	4	Spindle motor assembly	VXA1900		24	Screw	PMA30P050FCU
	5	Centering spring	VBH1024		25	E ring 2, 3	YE23FUC
A	6	Sheet	VEB1194		26	.....	
	7	Yoke plate A	VNE1835		27	Screw	CPZ20P080FMC
	8	Centering hub (A)	VNL1296		28	Loading motor	VXM1034
	9	Two stair gear	VNL1326				
	10	Gear pulley	VNL1249		101	.....	
				NSP	102	Motor pulley	VLL1176
	11	Cam gear	VNL1350	NSP	103	Oil stopped washer	VEB1002
	12	Follow gear	VNL1317	NSP	104	Rubber sheet	VEB1135
	13	Spring slanting cam	VNL1316	NSP	105	Housing assembly	VKP1566
	14	Cam spring	VBH1082				
	15	Radial spring	VBH1164	NSP	106	Turn table assembly	VXA1760
				NSP	107	Spindle motor	VXM1046
	16	Roller plate assembly	VXA1770				
	17	Slide cam	VNL1304				
	18	Screw (B)	VBA1008				
19	Screw (C)	VBA1015					
20	Return spring	VBH1129					



(10) TILT BASE (LOWER) SECTION

Parts List

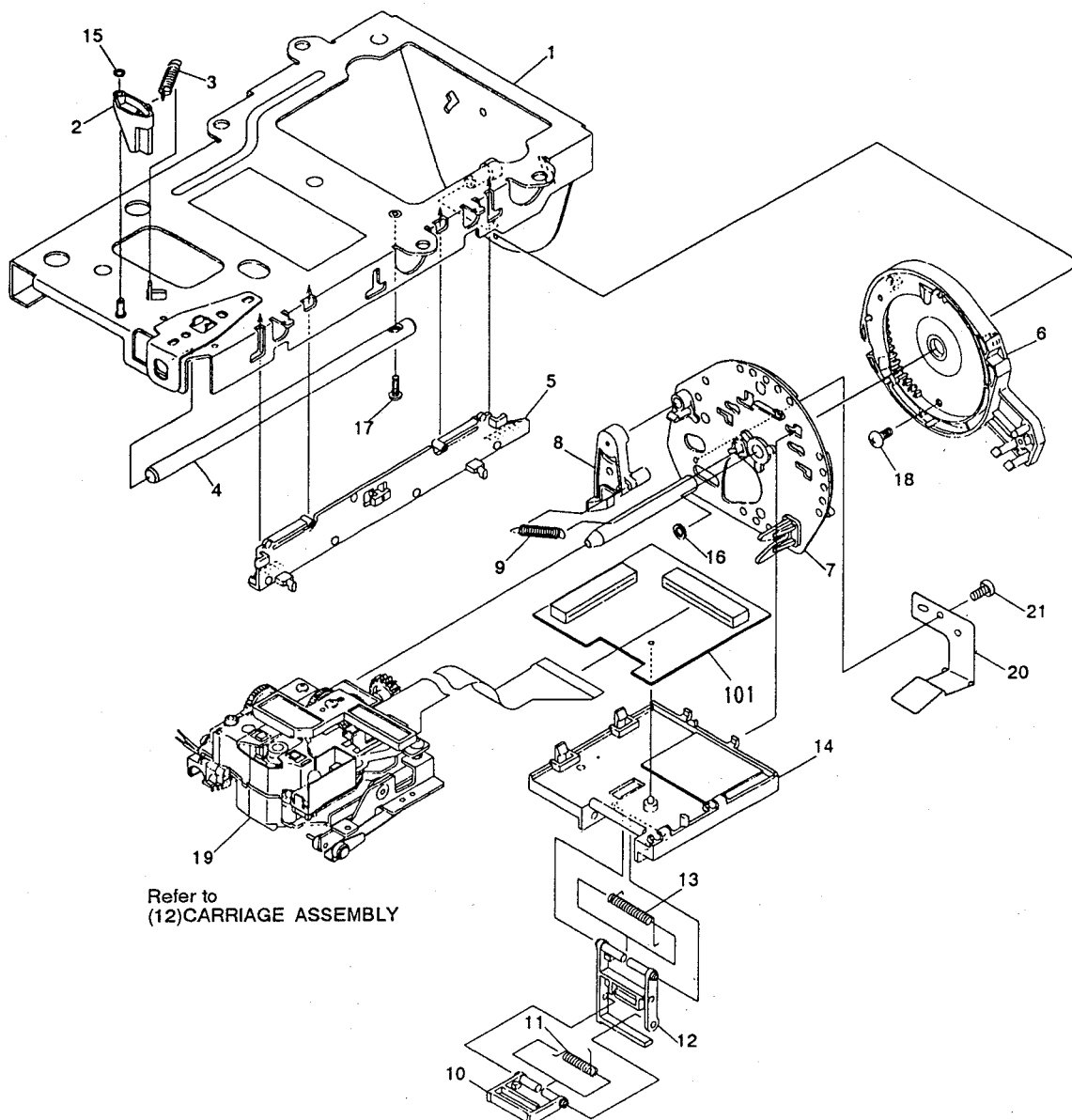
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
A	1	Tilt base (lower) assembly	VXA1798	11	Screw	IPZ20P080FMC	A
	2	Slide switch (LD, CDV INSIDE)	OSH1001	12	Screw	BMZ26P100FMC	
	3	Rack spring	VBH1133	13	Screw	PMZ20P060FMC	
	4	Rack gear (lower)	VNL1346	14	Screw	PMZ20P030FMC	
	5	Carriage shaft (lower)	VLL1325	NSP	101	SW holder	VNE1620
	6	Shaft plate (lower) assembly	VXA1626	NSP	102	Housing assembly	VKP1851
	7	S plate spring	VBH1149	NSP	103	Roller shaft holder	VNE1666
	8	.....		NSP	104	S plate holder	VNE1621
	9	Screw	BBZ30P060FCC				
	10	Screw	PPZ20P120FMC				



(11) TILT BASE (UPPER) SECTION

Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Tilt base (upper) assembly	VXA1808		11	Guide spring (B)	VBH1155
	2	SW lever	VNL1359		12	Harness guide (B)	VNL1408
	3	SW lever spring	VBH1150		13	Guide spring (A)	VBH1166
	4	Carriage shaft (upper)	VLL1324		14	Harness guide (A)	VNL1349
	5	Rack gear (upper)	VNL1345		15	Washer	WT16D032D025
⊙	6	Internal gear assembly	VXA1903		16	Washer	WT36D072D050
	7	R plate assembly	VXA1579		17	Screw	PMZ20P120FMC
	8	Lock lever	VNL1351	⊙	18	Screw	BBZ26P050FCC
	9	Lever spring	RBH1323		19	Carriage assembly	VWT1068
	10	Harness guide (C)	VNL1361		20	Lock plate	VBK1026
					21	Screw	IBZ20P040FZK
					22	Washer	WB20FMC
					23	Rack spring (upper)	VBH1198
NSP	101	CNNB assembly	VWG1194				



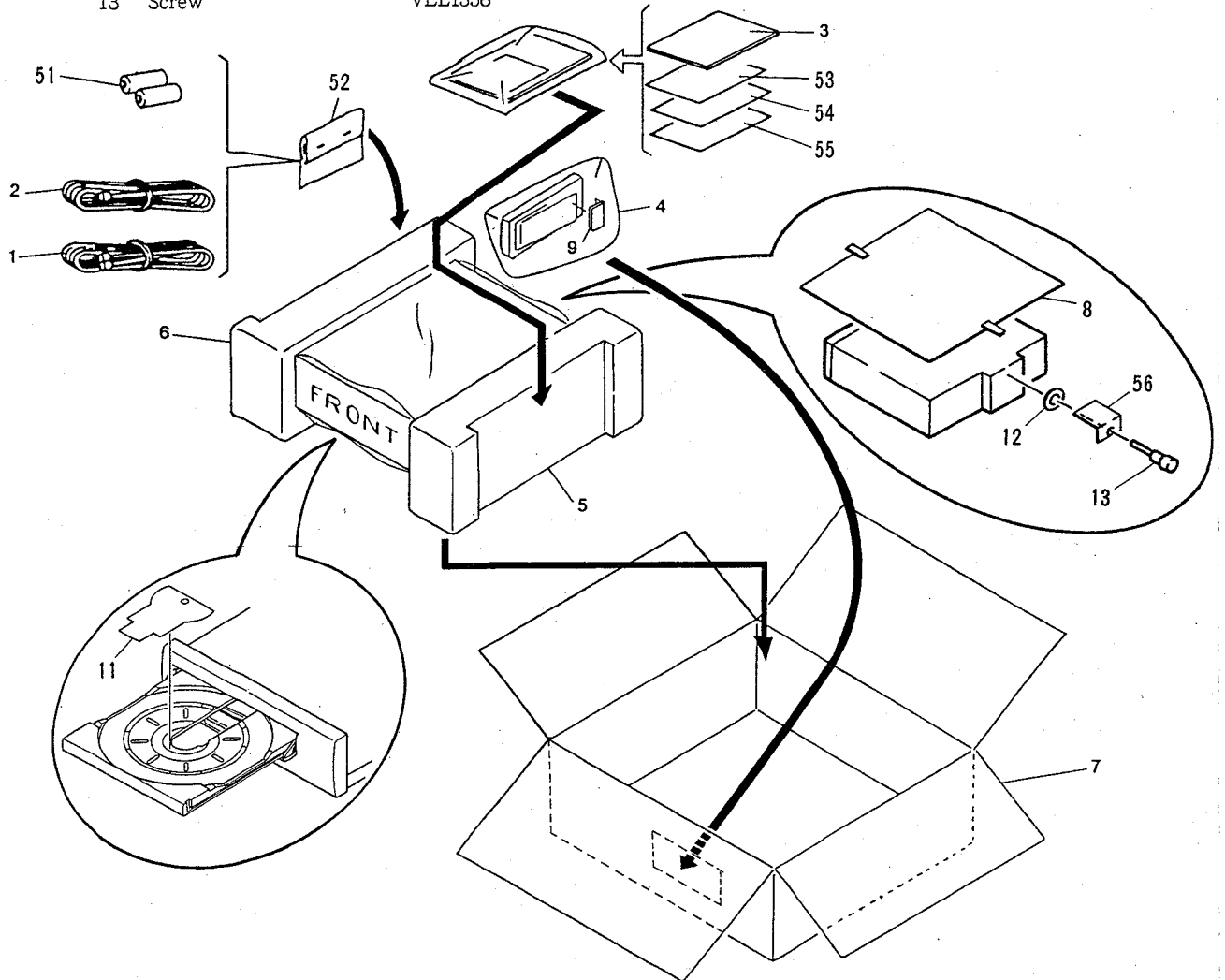
3. PACKING AND PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Connection cord	VDE-055	NSP	51	Dry cell battery	VEM-022
	2	Video cable	VDE-056			(R03, AAA)	
	3	Operating instructions	VRB1074	NSP	52	Vinyl bag	VHL-014
	4	Remote control unit	VXX1604	NSP	53	Caution card	VRR1009
	5	Pad (R)	VHA1083	NSP	54	Caution card (UC)	VRM1026
	6	Pad (L)	VHA1082	NSP	55	Caution card (UC)	VRM1039
	7	Packing case	VHG1230	NSP	56	Tac card	VRW1200
	8	Mirror mat	VHL1012				
	9	Battery cover	VNK1293				
	10	.....					
	11	Sheet	VRV1035				
	12	Washer	WT36D072D025				
	13	Screw	VLL1358				



4. SCHEMATIC AND PCB CONNECTIONS DIAGRAMS

Note: (Type 4)

1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:
Unit: k:k Ω , M:M Ω , or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance: (F): $\pm 1\%$, (G): $\pm 2\%$, (K): $\pm 10\%$, (M): $\pm 20\%$ or $\pm 5\%$ unless otherwise noted.

4. CAPACITORS:
Unit: p:pF or μ F unless otherwise noted.
Ratings: capacitor (μ F)/ voltage (V) unless otherwise noted.
Rated voltage: 50V except for electrolytic capacitors.

5. COILS:
Unit: m:mH or μ H unless otherwise noted.

6. VOLTAGE AND CURRENT:
 $\square$: DC voltage (V) in PLAY mode unless otherwise noted.
 $\rightarrow$ mA or $\leftarrow$ mA: DC current in PLAY mode unless otherwise noted.
Value in () is DC current in STOP mode.

7. OTHERS:
• $\rightarrow$: Signal route.
• $\odot$: Adjusting point.
• ∇ (Red) : Measurement point.
• The Δ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SWITCHES (Underline indicates switch position):

IRKB ASSEMBLY
S401: POWER ON - OFF

SW ASSEMBLY
S1 : TILT, LOADING 1
S2 : TILT, LOADING 2
S3 : TILT, LOADING 3

FLKB ASSEMBLY
S101: CHORUS
S102: VOCAL
S103: ONE - TOUCH KARAOKE
S104: ONCE MORE
S105: SURROUND
S106: VOCAL PARTNER
S107: OPEN/CLOSE
S108: SIDE A
S109: SIDE B
S110: PLAY/PAUSE
S111: STOP
S112: DOOR SW
S113: KARAOKE/NORMAL/AUX INPUT SELECTOR

CNNB ASSEMBLY
S201: INHIBIT

KAUB ASSEMBLY
S201: ATTENUATOR

DKKB ASSEMBLY

S301: 1
S302: 2
S303: 3
S304: 4
S305: 5
S306: 6
S307: 7
S308: 8
S309: 9
S310: 10
S311: 11
S312: 12
S313: 13
S314: 14
S315: 15
S316: 16
S317: 17
S318: 18
S319: 19
S320: 20

KCKB ASSEMBLY

S701: #
S702: b
S703: AUDIO MODE
S704: h

OUTSIDE OF ASSEMBLY
TRAY SW
TURN SW
LD, CDV INSIDE SW
VOLTAGE SELECTOR
(AC 110 - 127/220 - 240V)



CLD-2710K

(2) POWER SUPPLY BOARD ASSEMBLY (SYPS)

IC211,212 ICP-N20
F202,203 NT1-0.63A

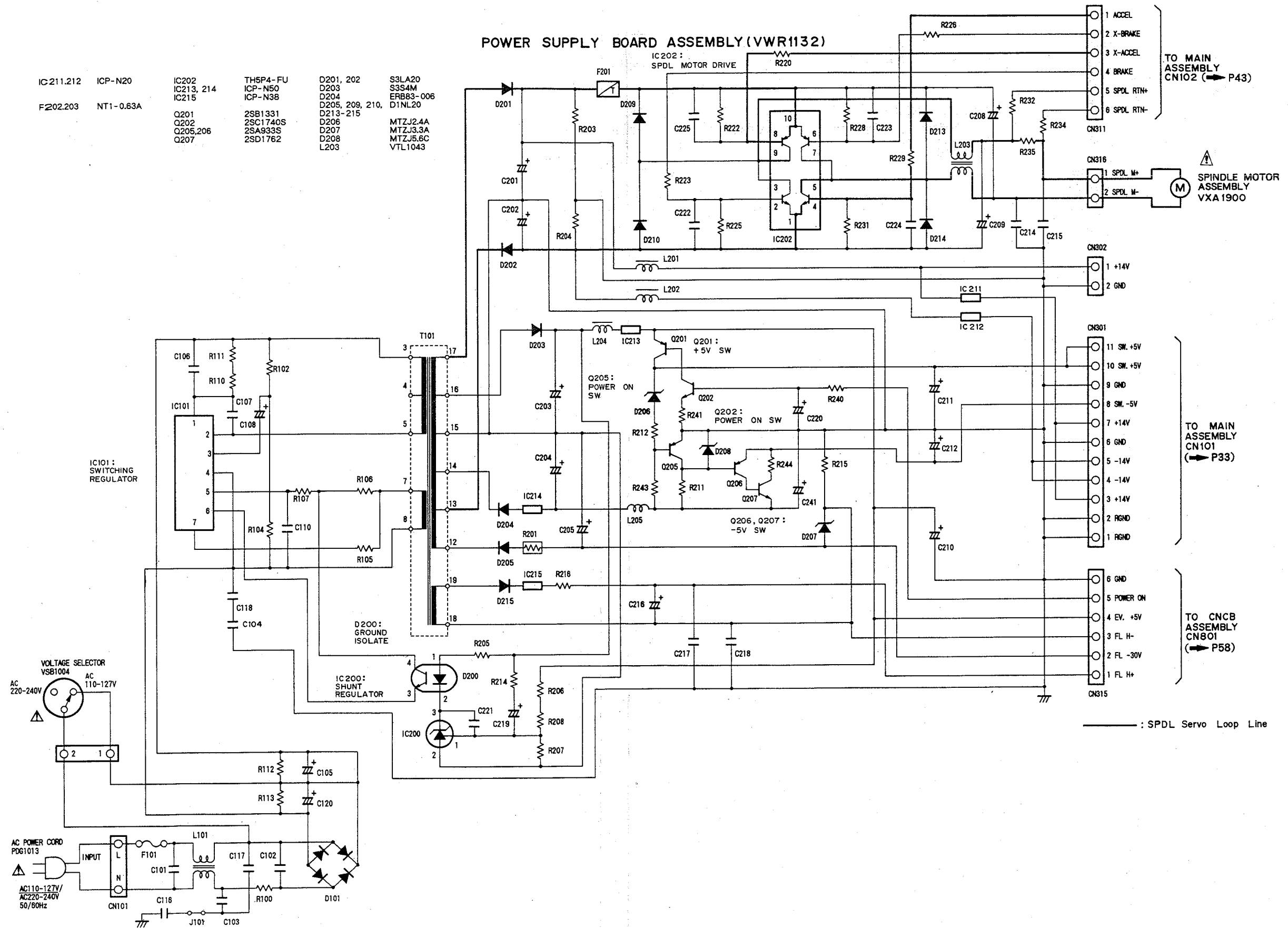
IC202 IC213, 214 IC215
Q201 Q202 Q205,206 Q207

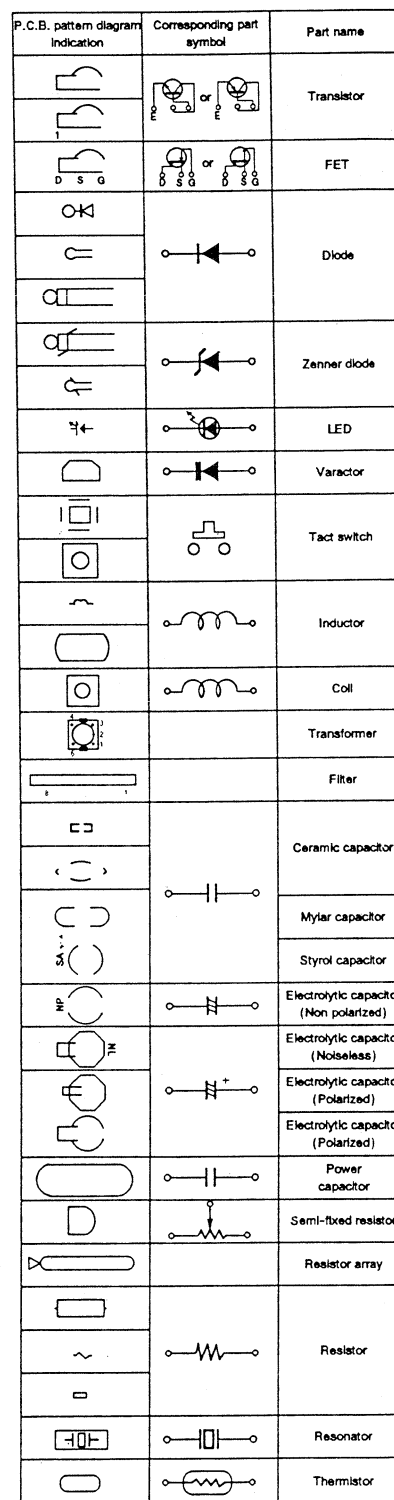
TH5P4-FU ICP-N50 ICP-N38
2SB1331 2SC1740S 2SA933S 2SD1762

D201, 202 D203 D204 D205, 209, 210, D213-215 D206 D207 D208 L203

S3LA20 S3S4M ERB83-006 D1NL20
MTZJ2.4A MTZJ3.3A MTZJ5.6C VTL1043

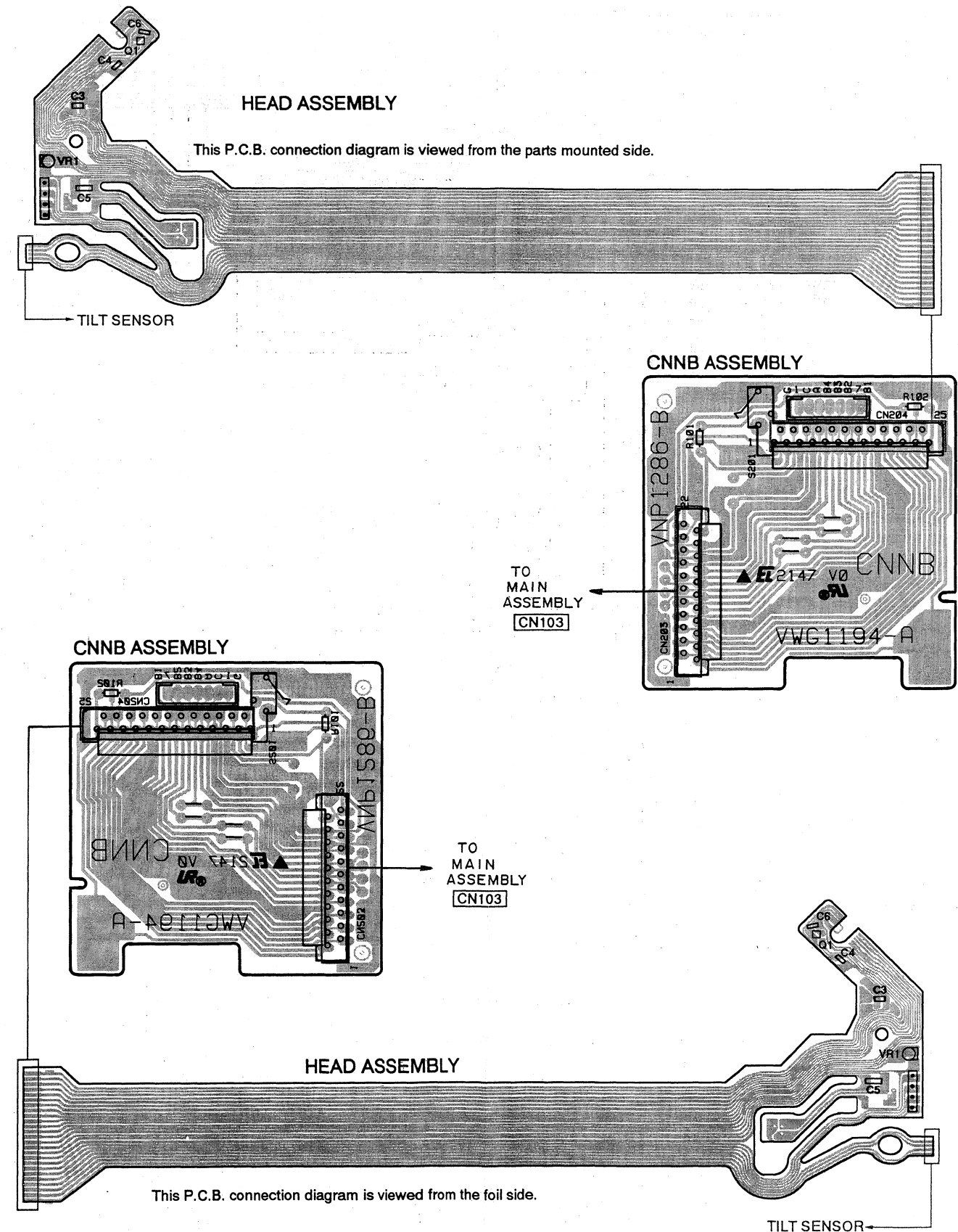
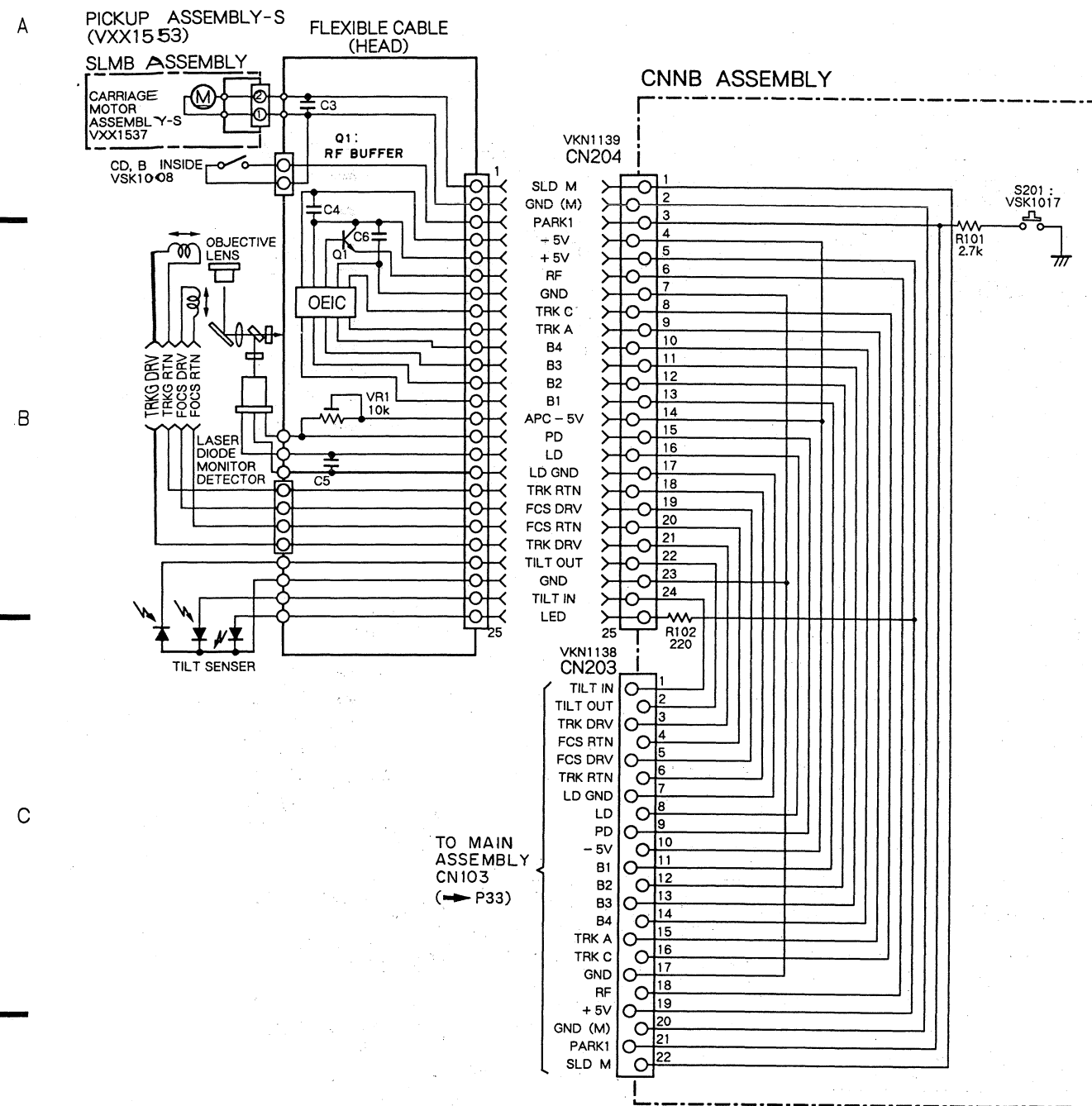
POWER SUPPLY BOARD ASSEMBLY (VWR1132)





1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with  shows negative terminal.
4. The diode marked with  shows cathode side.
5. The transistor terminal marked with  shows emitter.

(3) PICKUP AND CNNB ASSEMBLIES

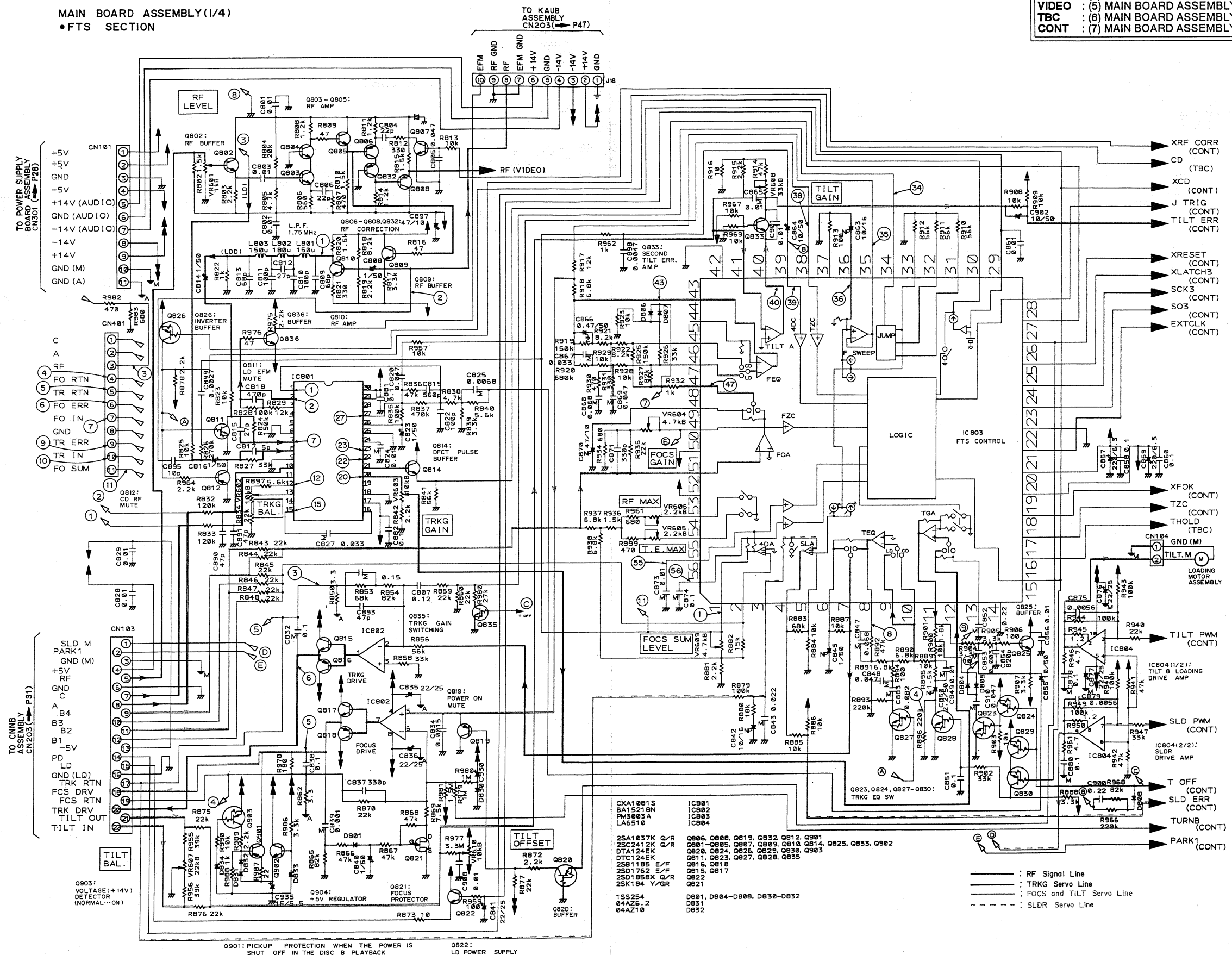


(4) MAIN BOARD ASSEMBLY (1/4)

MAIN BOARD ASSEMBLY(I/4)
• FTS SECTION

Note: Abbreviations listed indicate circuit connections.

FTS	: (4) MAIN BOARD ASSEMBLY (1/4)
VIDEO	: (5) MAIN BOARD ASSEMBLY (2/4)
TBC	: (6) MAIN BOARD ASSEMBLY (3/4)
CONT	: (7) MAIN BOARD ASSEMBLY (4/4)



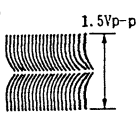
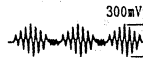
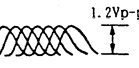
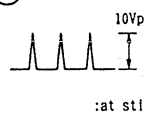
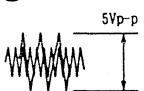
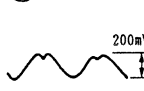
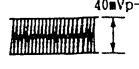
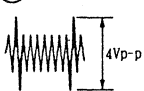
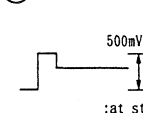
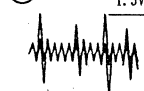
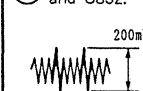
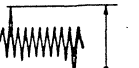
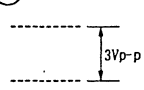
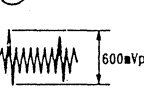
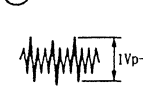
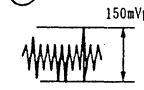
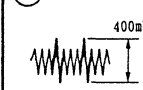
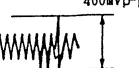
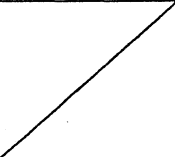
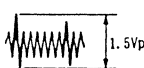
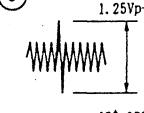
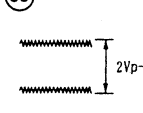
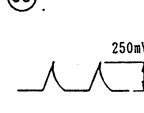
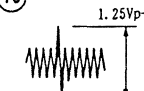
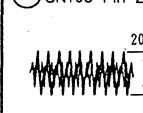
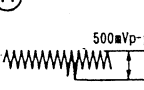
_____ : RF Signal Line
 _____ : TRKG Servo Line
 _____ : FOCS and TILT Servo Line
 - - - - - : SLDR Servo Line

CXA108B1 BA1521BN PM3003A LA6510	IC801 IC802 IC803 IC804	TRKG EQ SW
25A1037K Q/R 25C2412K Q/R DTC124KE 25K1185 2SD1162 E/F 2SD185BX Q/R 25K184 Y/R	Q006, Q008, Q819, Q832, Q812, Q901 Q801-Q805, Q807, Q809, Q810, Q814, Q820, Q824, Q825, Q828, Q830, Q835 Q811, Q823, Q827, Q828, Q835 Q816, Q818 Q815, Q817 Q822 Q821	Q825, Q833, Q902
15S254 04A26.2 04A10 04A10	DB01, DB04-DB08, DB30-DB32 DB31 DB32 DB33	

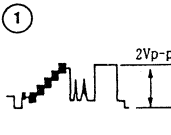
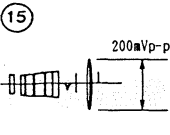
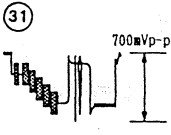
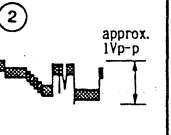
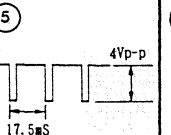
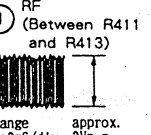
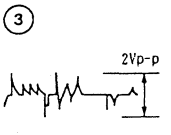
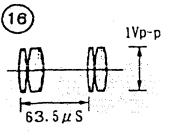
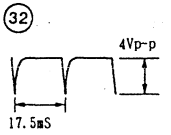
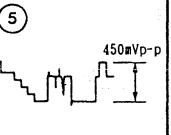
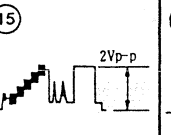
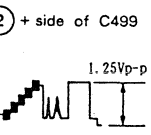
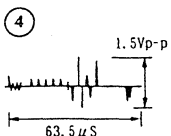
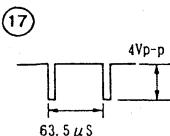
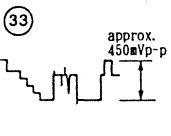
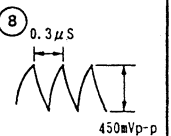
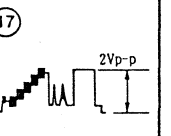
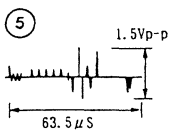
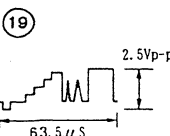
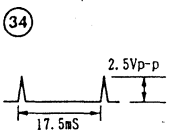
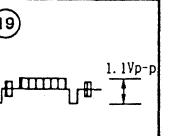
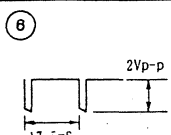
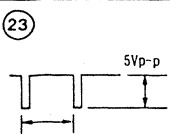
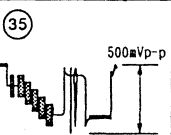
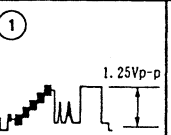
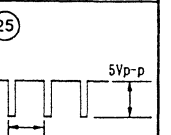
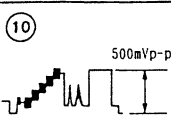
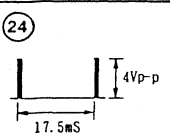
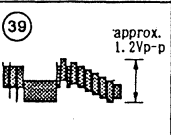
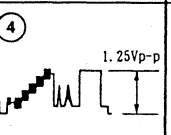
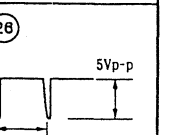
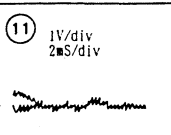
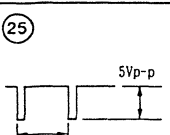
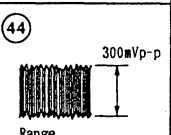
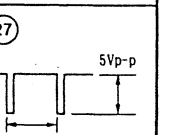
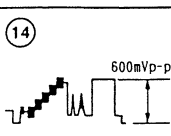
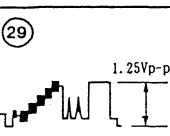
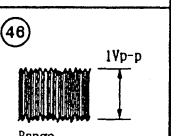
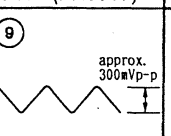
Q901:	PICKUP	PROTECTION	WHEN THE POWER IS	Q822:
	SHUT	OFF	IN THE DISC B PLAYBACK	LD POWER SUPPLY

Waveforms of the FTS section

Note : (No.) in the table correspond to the pin No.

IC801 (CXA1081S)		CN401	IC803 (PM3003A)		Other points
① 	②⑩ 	③ 	① 	③⑨ 	① Q810 Collector 
② 	②② 	④ 	⑧ 	④⑩ 	② Q809 Emitter 
⑦ 	②③ 	⑤ 	③④ 	④③ 	③ Between C830 and C832. 
⑫ 	②⑦ 	⑧ 	③⑤ 	④⑦ 	④ Q828 Collector 
⑮ 			⑦ 	③⑧ 	⑤⑤ 
			⑨ 	③⑧ 	⑤⑥ 
			⑩ 		⑥⑧ CN103 Pin 20 
			⑪ 		

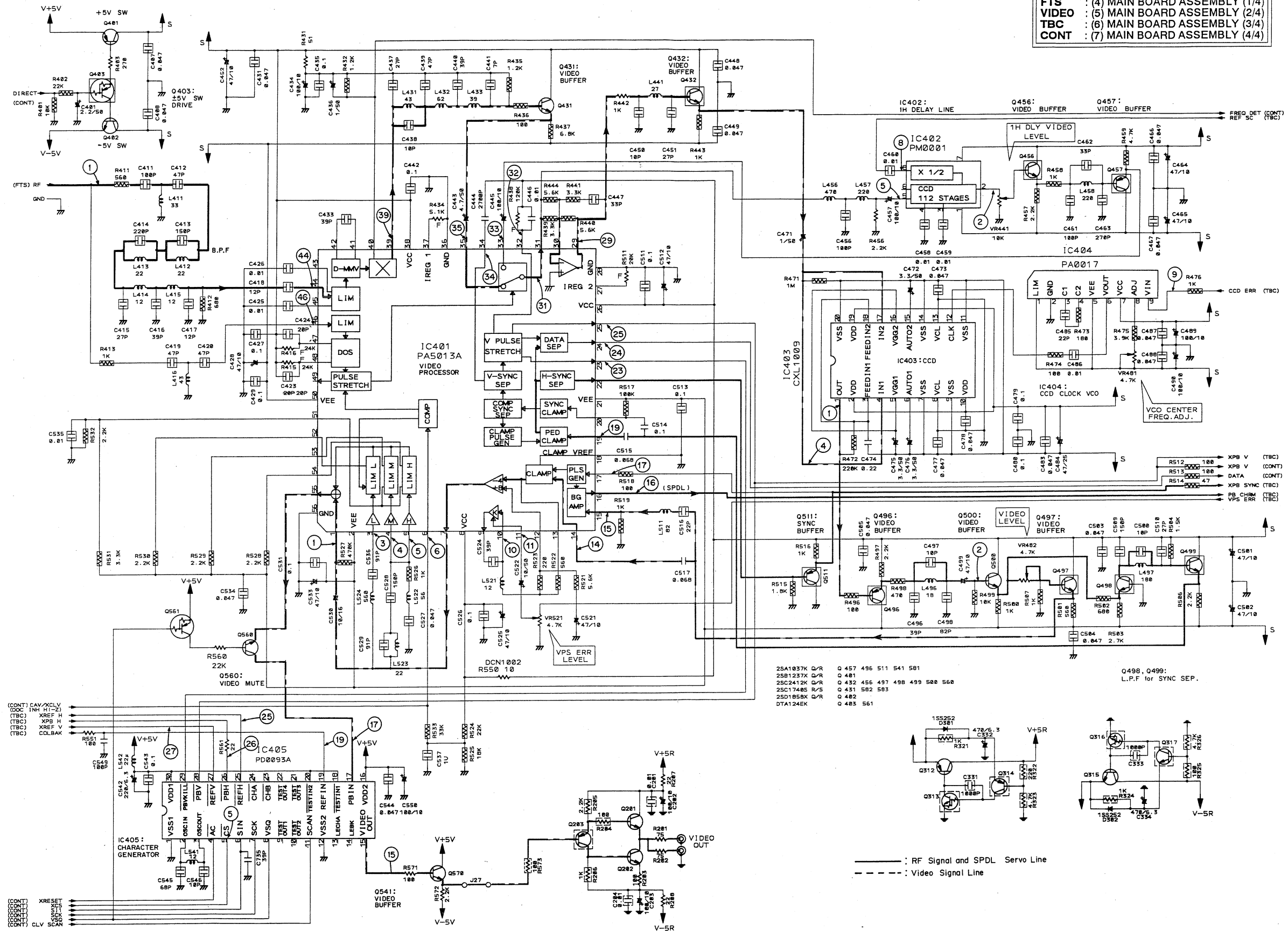
Waveforms of the VIDEO section Note : (No.) in the table correspond to the pin No.

IC401 (PA5013A)			IC402 (PM0001)	IC405 (PD0093A)	Other points
(1) 	(15) 	(31) 	(2) 	(5) 	(1) RF (Between R411 and R413) 
(3) 	(16) 	(32) 	(5) 	(15) 	(2) + side of C499 
(4) 	(17) 	(33) 	(8) 	(17) 	
(5) 	(19) 	(34) 	IC403 (CXL1009P)		(19) 
(8) 	(23) 	(35) 	(1) 	(25) 	
(10) 	(24) 	(39) 	(4) 	(26) 	
(11) 	(25) 	(44) 	IC404 (PA0017)		(27) 
(14) 	(29) 	(46) 	(9) 		

(5) MAIN BOARD ASSEMBLY (2/4)

MAIN BOARD ASSEMBLY (2/4)

• VIDEO SECTION



Note: Abbreviations listed indicate circuit connections.

FTS : (4) MAIN BOARD ASSEMBLY (1/4)
VIDEO : (5) MAIN BOARD ASSEMBLY (2/4)
TBC : (6) MAIN BOARD ASSEMBLY (3/4)
CONT : (7) MAIN BOARD ASSEMBLY (4/4)

• VIT

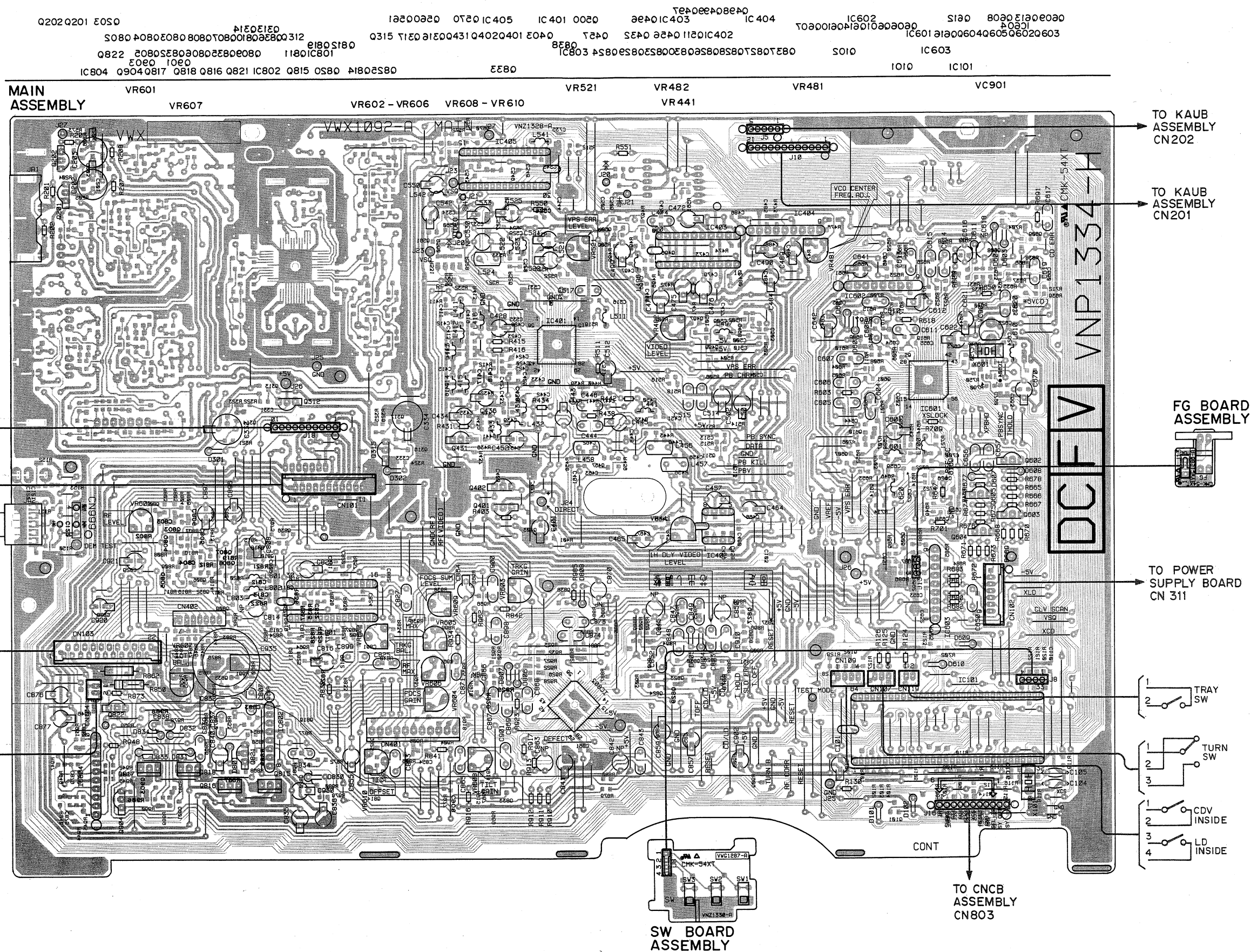
TO AS
CN

TO POW
SUPPL
CN301

T
A
C

LOADING TII
MOTOR

• View from component side



MAIN
• TBC



VII

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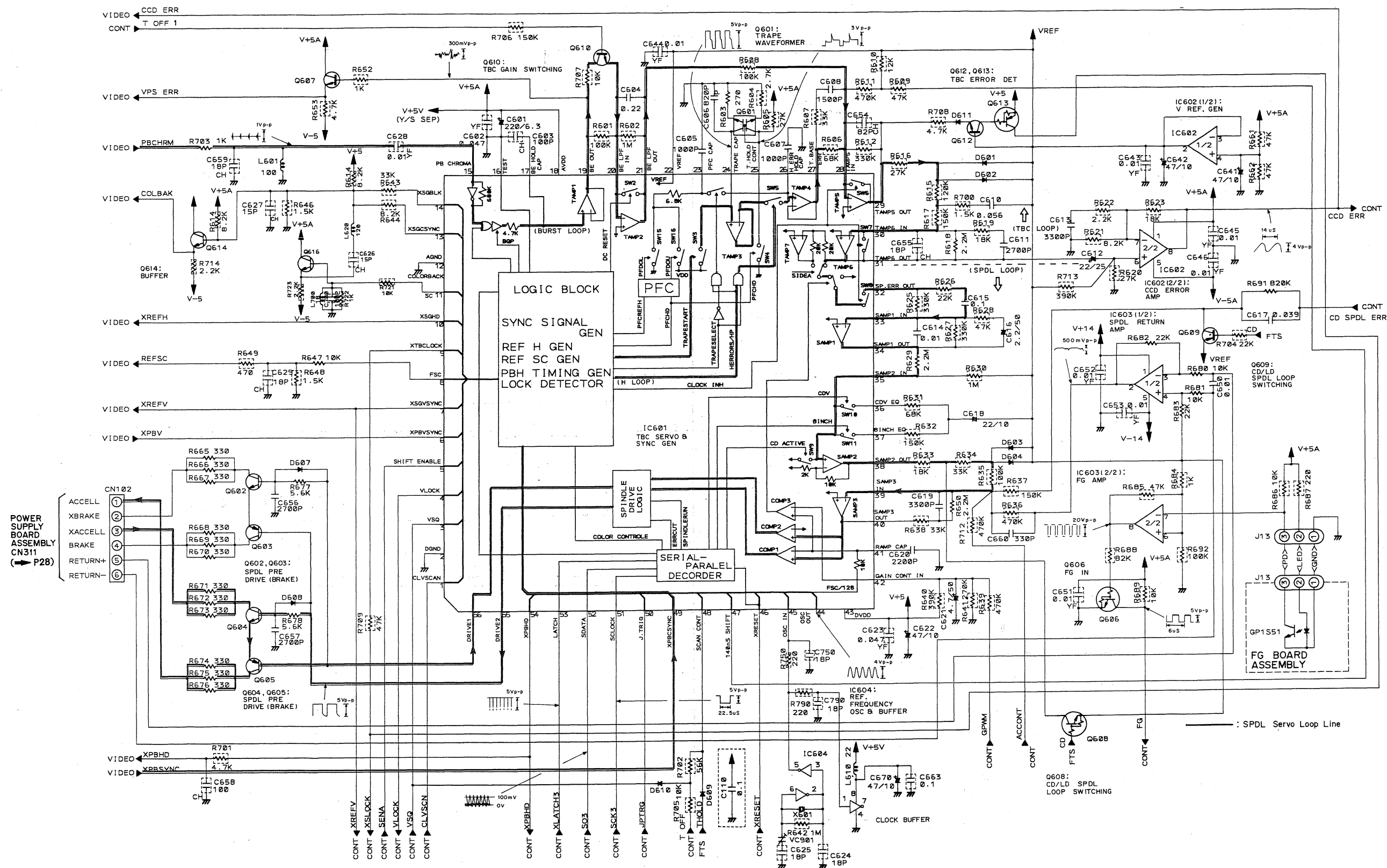
7

MAIN BOARD ASSEMBLY(3/4)

•TBC SECTION

Note: Abbreviations listed indicate circuit connections.

FTS	: (4) MAIN BOARD ASSEMBLY (1/4)
VIDEO	: (5) MAIN BOARD ASSEMBLY (2/4)
TBC	: (6) MAIN BOARD ASSEMBLY (3/4)
CONT	: (7) MAIN BOARD ASSEMBLY (4/4)



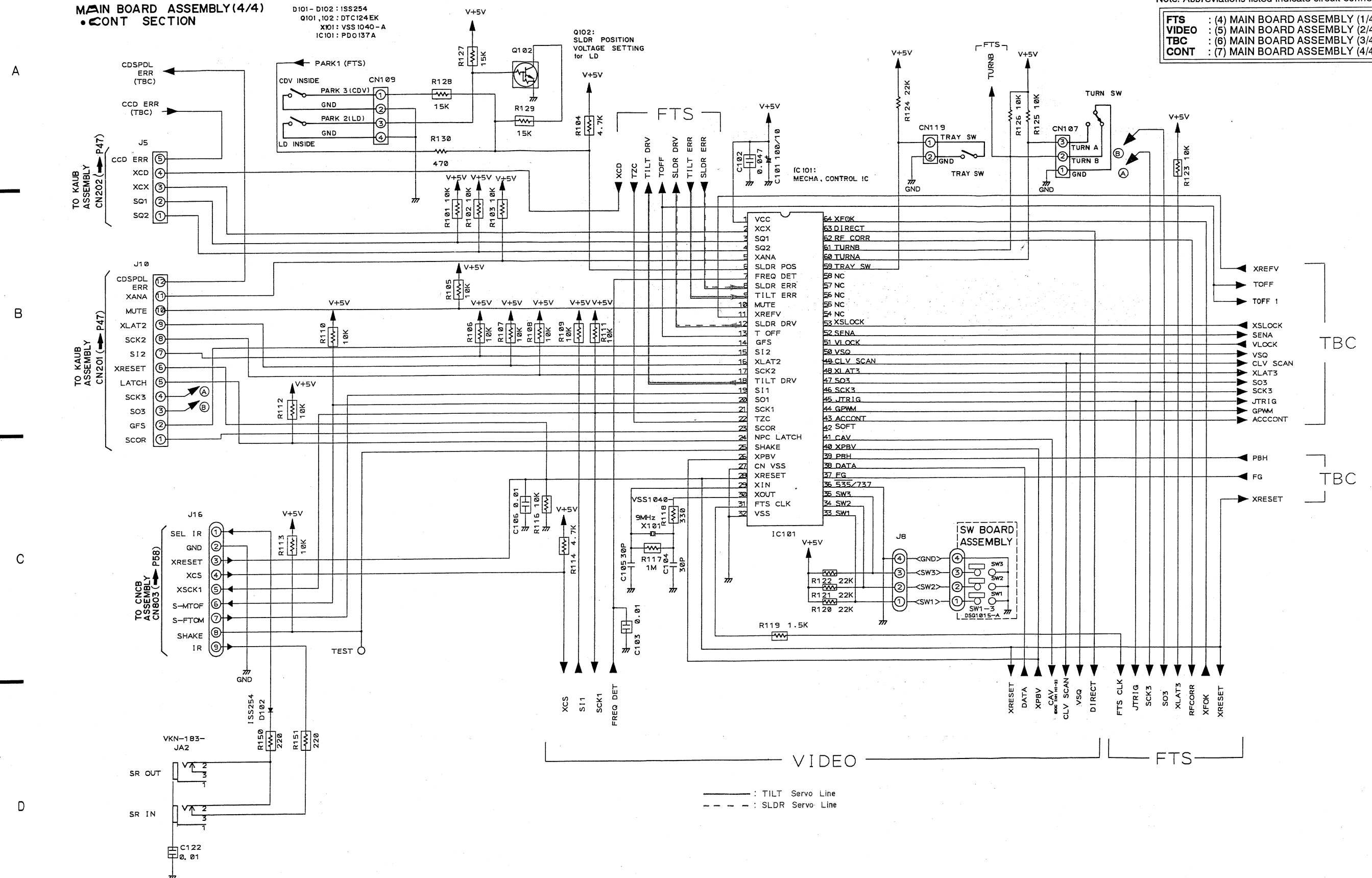
(7) MAIN BOARD ASSEMBLY (4/4) AND SW BOARD ASSEMBLY

MAIN BOARD ASSEMBLY (4/4)
CONT SECTION

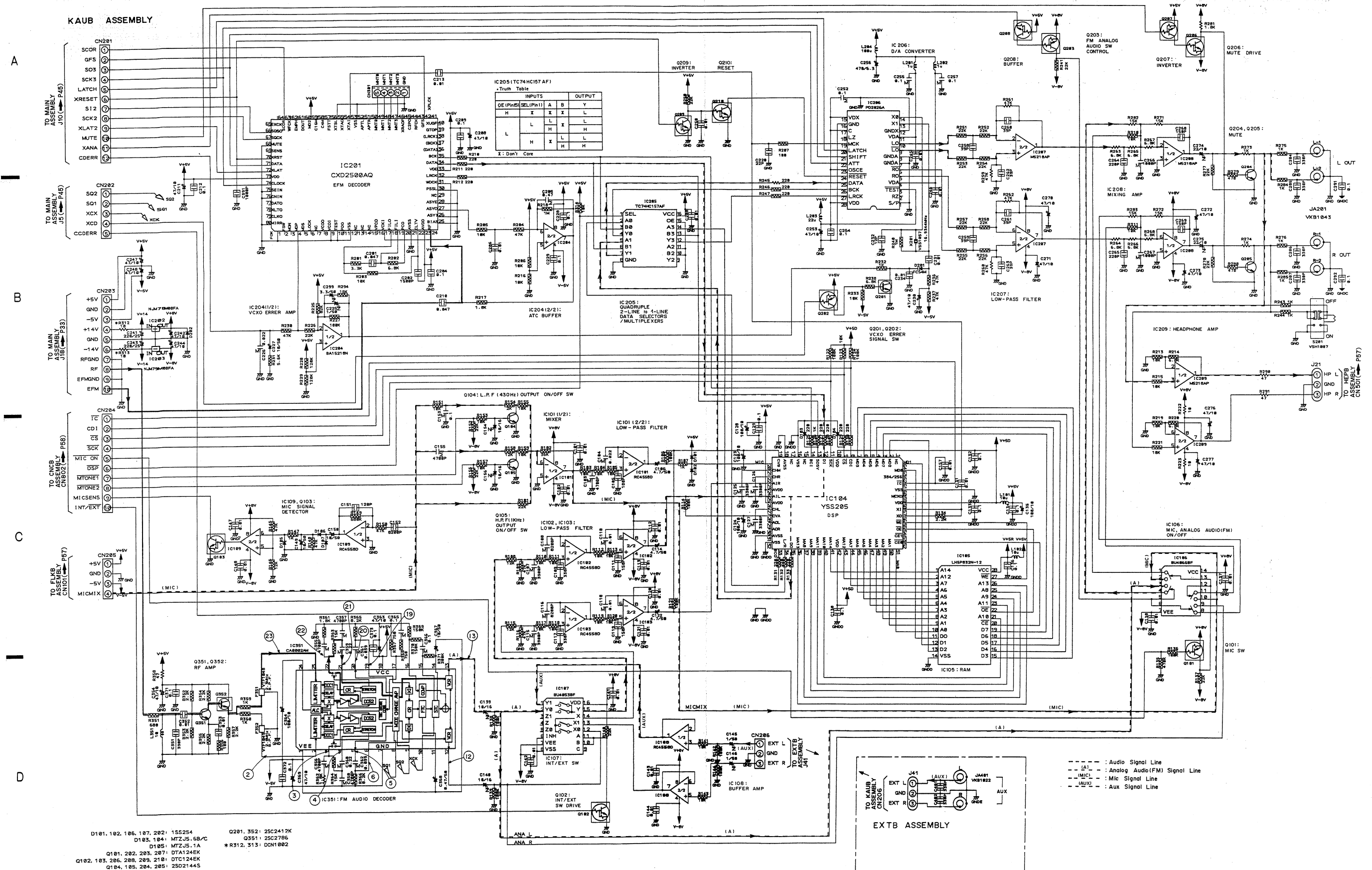
D101 - D102 : ISS254
Q101, 102 : DTC124EK
X101 : VSS1040-A
IC101 : PDO137A

Note: Abbreviations listed indicate circuit connections.

FTS : (4) MAIN BOARD ASSEMBLY (1/4)
VIDEO : (5) MAIN BOARD ASSEMBLY (2/4)
TBC : (6) MAIN BOARD ASSEMBLY (3/4)
CONT : (7) MAIN BOARD ASSEMBLY (4/4)



(8) EXTB AND KAUB ASSEMBLIES

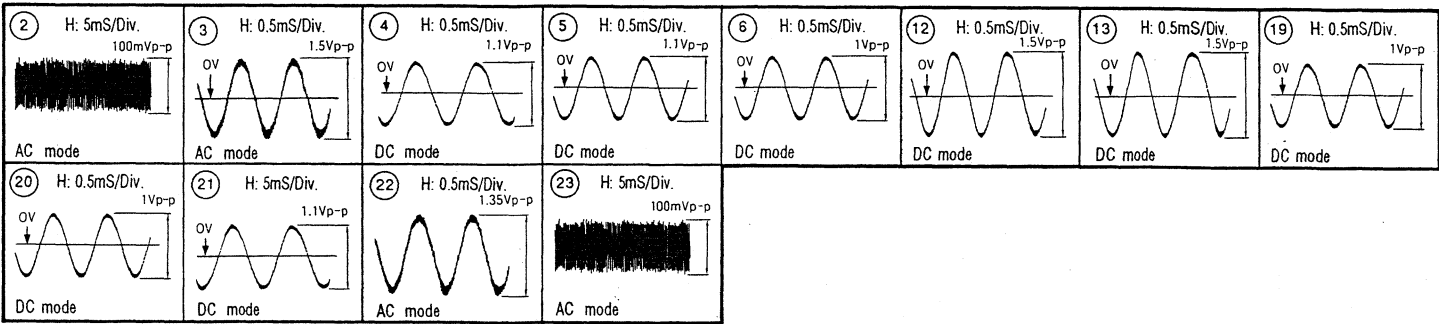


Note: Waveforms and voltages are at the PLAY mode.
IC351 (CA0002AM)

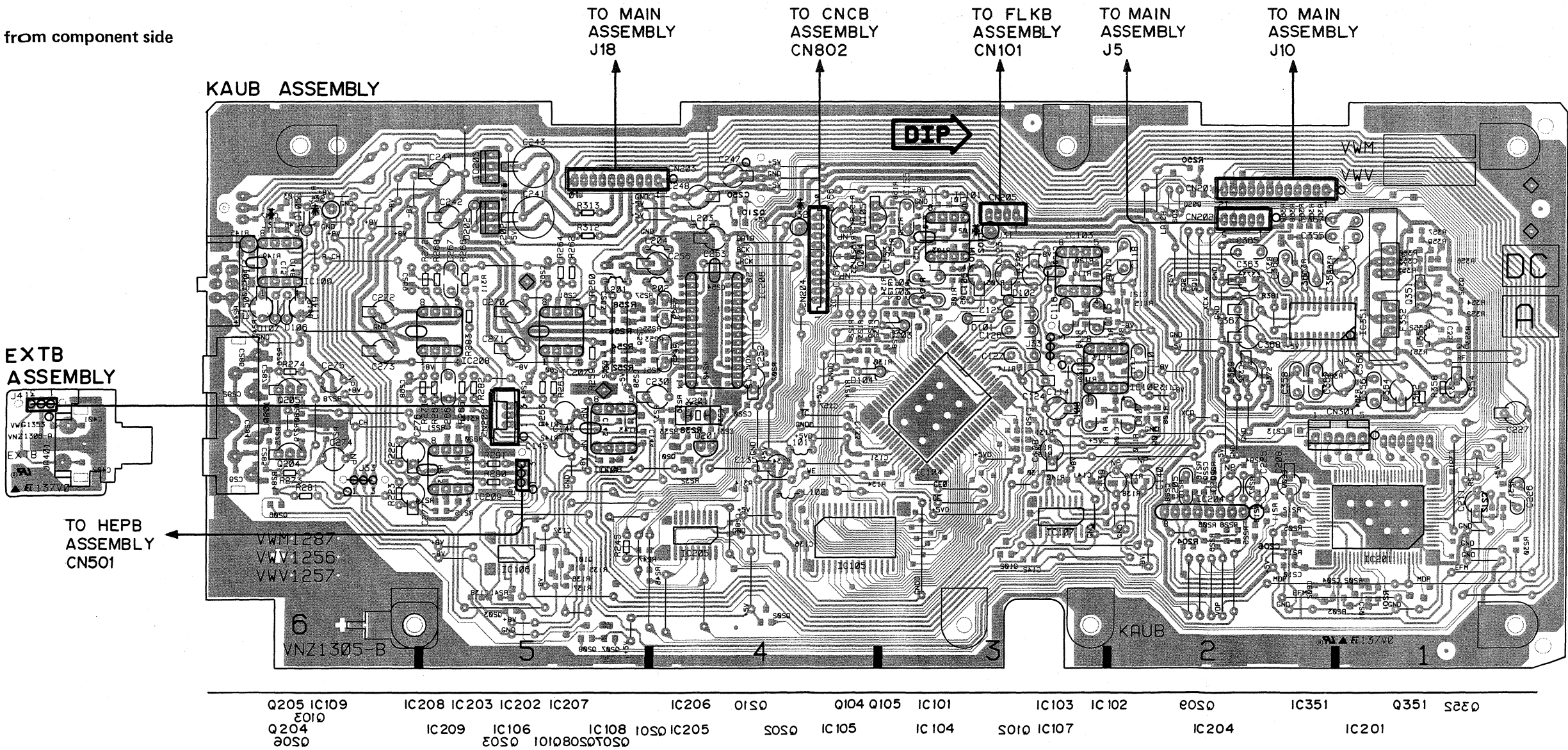
Pin No.	Voltage	Pin No.	Voltage
1	-5	13	*
2	*	14	-0.6
3	*	15	-0.6
4	*	16	0
5	*	17	0
6	*	18	+5
7	0	19	*
8	0	20	*
9	0	21	*
10	+5	22	*
11	+2	23	*
12	*	24	-2.2

* : Refer to waveform

Note: (No.) in the table correspond to the pin number.
IC351 (CA0002AM)



• View from component side



* : Refer to waveform

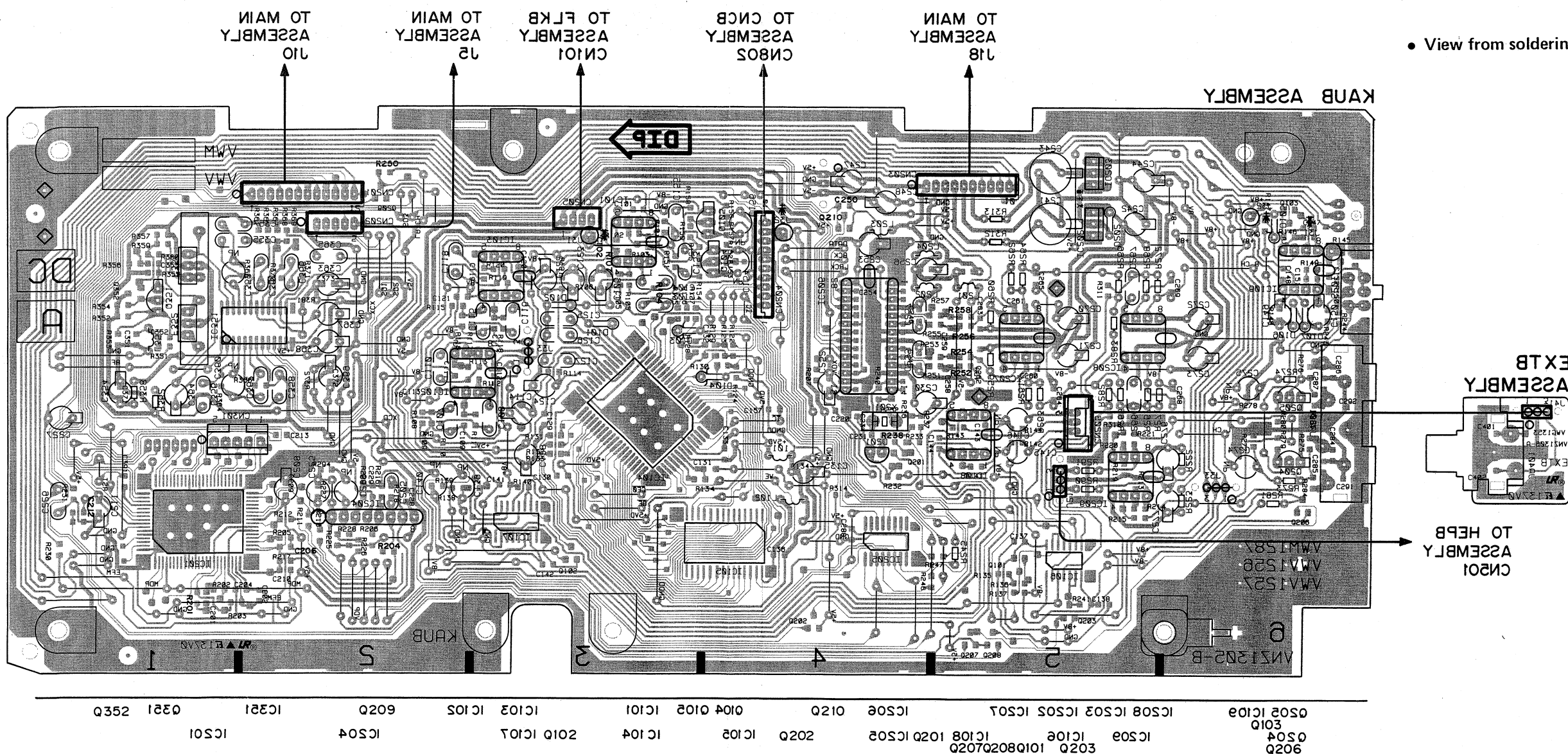
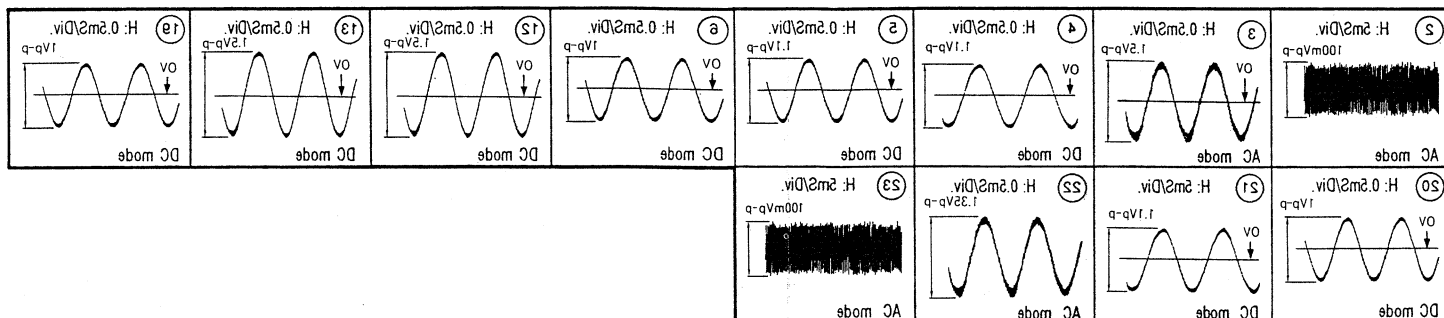
3

5

C

(MA0005AM) 13521

Note: (No.) in the table correspond to the pin number.

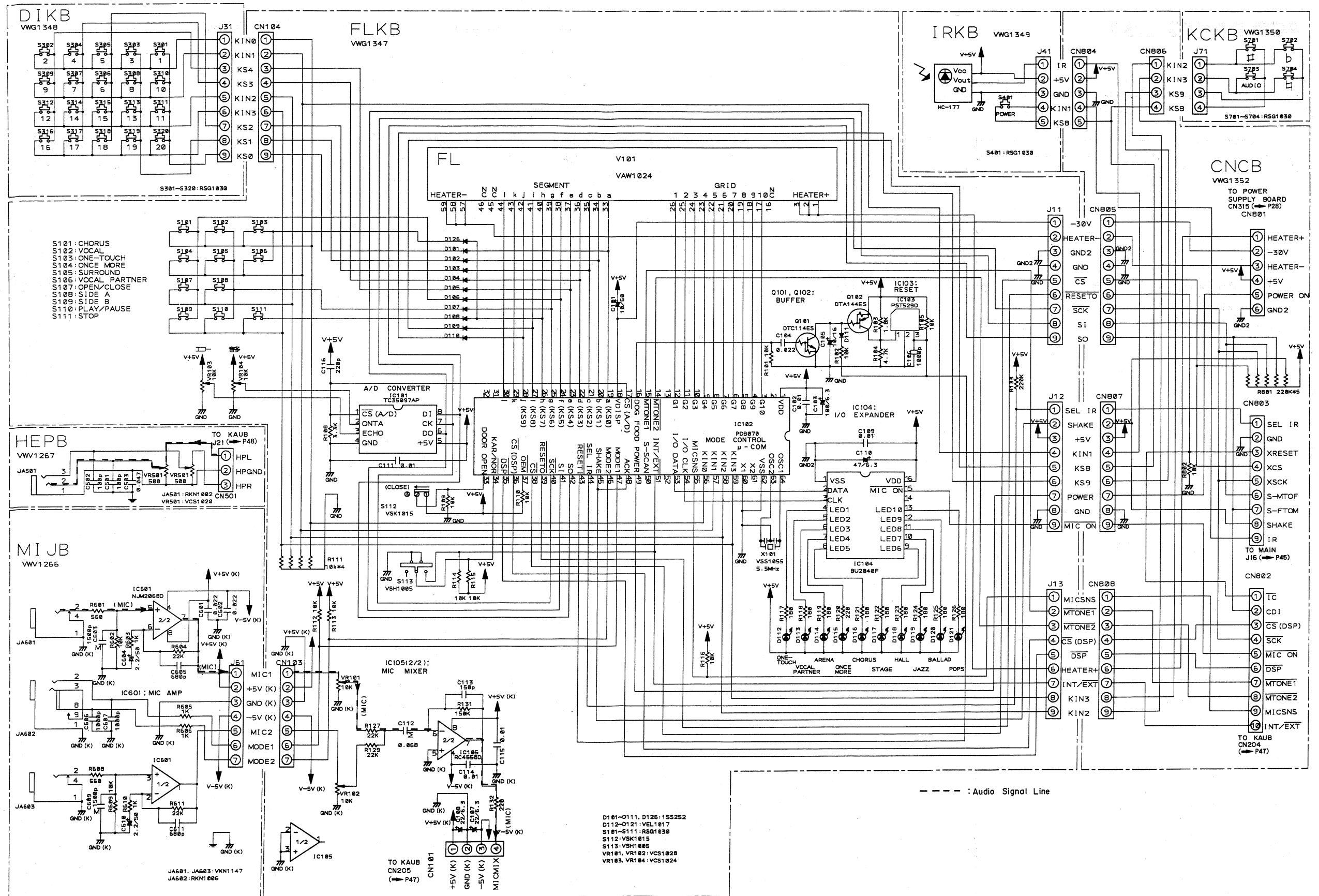


- **View from soldering side**



- View from component side





5. PCB PARTS LIST

NOTES:

- Parts marked by “NSP” are generally unavailable because they are not in our Master Spare Parts List.
- Parts marked by “⊙” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The △ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10¹ → 561 RD1/4PS

5	6	1
---	---	---

 J
47k Ω → 47 × 10³ → 473 RD1/4PS

4	7	3
---	---	---

 J
0.5 Ω → 0R5 RN2H

0	R	5
---	---	---

 K
1 Ω → 010 RS1P

0	1	0
---	---	---

 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 RN1/4SR

5	6	2	1
---	---	---	---

 F

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
LIST OF ASSEMBLIES							
⊙	VSOP ASSEMBLY		VWM1286				
NSP	└MAIN ASSEMBLY		VWX1129				
NSP	└FG BOARD ASSEMBLY		VWG1286				
NSP	└SW BOARD ASSEMBLY		VWG1287				
⊙	KRAB ASSEMBLY		VWM1287				
NSP	└KAUB ASSEMBLY		VWV1257				
NSP	└EXTB ASSEMBLY		VWG1353				
⊙	FRPB ASSEMBLY		VWM1288				
NSP	└FLKB ASSEMBLY		VWG1347				
NSP	└DIKB ASSEMBLY		VWG1348				
NSP	└IRKB ASSEMBLY		VWG1349				
NSP	└KCKB ASSEMBLY		VWG1350				
NSP	└CNCB ASSEMBLY		VWG1352				
NSP	└MIJB ASSEMBLY		VWV1266				
NSP	└HEPB ASSEMBLY		VWV1267				
⊙	POWER SUPPLY BOARD ASSEMBLY		VWR1132				
NSP	CNNB ASSEMBLY		VWG1194				
NSP	HEAD ASSEMBLY		VWV1178				

MAIN ASSEMBLY

SEMICONDUCTORS

IC101 MECHANISM CONT. MCU	PD0137A
IC401 VIDEO IC	PA5013A
IC402 CDD DELAY LINE	PM0001
IC403 IC	CXL1009P
IC404	PA0017
IC405 CHARACTER GENE IC	PD0093A
IC601 TBC IC	PM3002
IC602, 603 OP-AMP IC	NJM4558S
IC604 LOGIC IC	TC7WU04F-TL
IC801 PRE AMP IC	CXA1081S
IC802 IC	BA15218N
IC803 FTS IC	PM3003A
IC804 POWER OP AMP	LA6510L
Q101, 102	DTC124EK
Q201, 202 TRANSISTOR	2SC1740S

Q203 CHIP TRANSISTOR	2SA1037K
Q312 TRANSISTOR	2SB1237X
Q313	DTC124EK
Q314 CHIP TRANSISTOR	2SA1037K
Q315 TRANSISTOR	2SD1858X
Q316 DIGITAL TRANSISTOR	DTA124EK
Q317 CHIP TRANSISTOR	2SC2412K
Q401 TRANSISTOR	2SB1237X
Q402 TRANSISTOR	2SD1858X
Q403 DIGITAL TRANSISTOR	DTA124EK
Q431 TRANSISTOR	2SC1740S
Q432 CHIP TRANSISTOR	2SC2412K
Q456 CHIP TRANSISTOR	2SC2412K
Q457 CHIP TRANSISTOR	2SA1037K
Q496 CHIP TRANSISTOR	2SA1037K
Q497-500 CHIP TRANSISTOR	2SC2412K
Q511 CHIP TRANSISTOR	2SA1037K
Q560 CHIP TRANSISTOR	2SC2412K
Q561 DIGITAL TRANSISTOR	DTA124EK
Q570 CHIP TRANSISTOR	2SC2412K
Q601	FMW2-TR
Q602 TRANSISTOR	2SC1740S
Q603 TRANSISTOR	2SA933S
Q604 TRANSISTOR	2SC1740S
Q605 TRANSISTOR	2SA933S
Q606	DTC124EK
Q607 CHIP TRANSISTOR	2SC2412K
Q608	DTC124EK
Q609 CHIP TRANSISTOR	2SA1037K
Q610 CHIP TRANSISTOR	2SC2412K
Q612 CHIP TRANSISTOR	2SC2412K
Q613 DIGITAL TRANSISTOR	DTA124EK
Q614 CHIP TRANSISTOR	2SC2412K
Q616 CHIP TRANSISTOR	2SC2412K
Q802-805 CHIP TRANSISTOR	2SC2412K
Q806 CHIP TRANSISTOR	2SA1037K
Q807 CHIP TRANSISTOR	2SC2412K
Q808 CHIP TRANSISTOR	2SA1037K
Q809, 810 CHIP TRANSISTOR	2SC2412K
Q811	DTC124EK

Mark	No.	Description	Part No.
	Q812	CHIP TRANSISTOR	2SA1037K
	Q814	CHIP TRANSISTOR	2SC2412K
	Q815	TRANSISTOR	2SD1762-F8
	Q816	TRANSISTOR	2SB1185-F8
	Q817	TRANSISTOR	2SD1762-F8
	Q818	TRANSISTOR	2SB1185-F8
	Q819	CHIP TRANSISTOR	2SA1037K
	Q820	DIGITAL TRANSISTOR	DTA124EK
	Q821	N-FET	2SK184
	Q822	TRANSISTOR	2SD1858X
	Q823		DTC124EK
	Q824	DIGITAL TRANSISTOR	DTA124EK
	Q825	CHIP TRANSISTOR	2SC2412K
	Q826	DIGITAL TRANSISTOR	DTA124EK
	Q827, 828		DTC124EK
	Q829, 830	DIGITAL TRANSISTOR	DTA124EK
	Q832	CHIP TRANSISTOR	2SA1037K
	Q833	CHIP TRANSISTOR	2SC2412K
	Q835		DTC124EK
	Q836	CHIP TRANSISTOR	2SA1037K
	Q837		DTC124EK
	Q838	CHIP TRANSISTOR	2SC2412K
	Q901	CHIP TRANSISTOR	2SA1037K
	Q903	DIGITAL TRANSISTOR	DTA124EK
	Q904	TRANSISTOR	2SC1740S
	D101, 102	DIODE	1SS254
	D301, 302	DIODE	1SS252
	D601-604	DIODE	1SS254
	D607-611	DIODE	1SS254
	D801	DIODE	1SS254
	D804-808	DIODE	1SS254
	D830-832	DIODE	1SS254
	D833	ZENER DIODE	04AZ6, 2-Y
	D834	ZENER DIODE	04AZ10-Y
COILS/TRANSFORMERS			
	L411	AXIAL INDUCTOR	LAU330J
	L412, 413	AXIAL INDUCTOR	LAU220J
	L414, 415	AXIAL INDUCTOR	LAU120J
	L416	AXIAL INDUCTOR	LAU430J
	L431	AXIAL INDUCTOR	LAU430J
	L432	AXIAL INDUCTOR	LAU620J
	L433	AXIAL INDUCTOR	LAU390J
	L441	AXIAL INDUCTOR	LAU270J
	L456	RADIAL INDUCTOR	LFA471J
	L457, 458	RADIAL INDUCTOR	LFA221J
	L496	AXIAL INDUCTOR	LAU180J
	L497	AXIAL INDUCTOR	LAU181J
	L511	AXIAL INDUCTOR	LAU820J
	L521	AXIAL INDUCTOR	LAU120J
	L522	AXIAL INDUCTOR	LAU560J
	L523	AXIAL INDUCTOR	LAU220J
	L524	RADIAL INDUCTOR	LFA561K
	L541	AXIAL INDUCTOR	LAU120J
	L542	AXIAL INDUCTOR	LAU220J
	L601	AXIAL INDUCTOR	LAU101J
	L610	AXIAL INDUCTOR	LAU220J

Mark	No.	Description	Part No.
	L620	AXIAL INDUCTOR	LAU121J
	L700	AXIAL INDUCTOR	LAU180J
	L801	AXIAL INDUCTOR	LAU151J
	L802	AXIAL INDUCTOR	LAU181J
	L803	AXIAL INDUCTOR	LAU151J
CAPACITORS			
	C101	ELECT. CAPACITOR	CEAS101M10
	C102	CERAMIC CAPACITOR	CKSQYF473Z25
	C103	CHIP CAPACITOR	CKSQYF103Z50
	C104, 105	CERAMIC CAPACITOR	CCCH300J50
	C106	CHIP CAPACITOR	CKSQYF103Z50
	C110	CERAMIC CAPACITOR	CKSQYF104Z25
	C120, 121	CHIP CAPACITOR	CKSQYB102K50
	C122	CHIP CAPACITOR	CKSQYF103Z50
	C201	CHIP CAPACITOR	CKSQYF103Z50
	C202, 203	ELECT. CAPACITOR	CEAS101M10
	C204	CHIP CAPACITOR	CKSQYF103Z50
	C331	CHIP CAPACITOR	CKSQYB102K50
	C332	ELECT. CAPACITOR	CEAS471M6R3
	C333	CHIP CAPACITOR	CKSQYB102K50
	C334	ELECT. CAPACITOR	CEAS471M6R3
	C401	ELECTR. CAPACITOR	CEAL2R2M50
	C407, 408	CERAMIC CAPACITOR	CKSQYF473Z25
	C411	CHIP CAPACITOR	CCSQCH101J50
	C412	CHIP CAPACITOR	CCSQCH470J50
	C413	CHIP CAPACITOR	CCSQCH151J50
	C414	CHIP CERAMIC C.	CCSQCH221J50
	C415	CHIP CAPACITOR	CCSQCH270J50
	C416	CHIP CAPACITOR	CCSQCH390J50
	C417, 418	CHIP CAPACITOR	CCSQCH120J50
	C419, 420	CHIP CAPACITOR	CCSQCH470J50
	C423, 424	CHIP CERAMIC C.	CCSQCH200J50
	C425, 426	CHIP CAPACITOR	CKSQYF103Z50
	C427	CERAMIC CAPACITOR	CKSQYF104Z25
	C428	ELECT. CAPACITOR	CEAS470M10
	C429	CERAMIC CAPACITOR	CKSQYF104Z25
	C431	CERAMIC CAPACITOR	CKSQYF473Z25
	C433	CHIP CAPACITOR	CCSQCH390J50
	C434	ELECT. CAPACITOR	CEAS101M10
	C435	CERAMIC CAPACITOR	CKSQYF104Z25
	C436	ELECT. CAPACITOR	CEAS010M50
	C437	CHIP CAPACITOR	CCSQCH270J50
	C438	CHIP CAPACITOR	CCSQCH100D50
	C439	CHIP CAPACITOR	CCSQCH470J50
	C440	CHIP CAPACITOR	CCSQCH390J50
	C441	CHIP CAPACITOR	CCSQCH070D50
	C442	CERAMIC CAPACITOR	CKSQYF104Z25
	C443	ELECT. CAPACITOR	CEAS4R7M50
	C444	MYLAR FILM CAPACITOR	CQMA272J50
	C445	ELECT. CAPACITOR	CEAS101M10
	C446	AUDIO FILM CAPACITOR	CFTXA103J50
	C447	CHIP CAPACITOR	CCSQCH330J50
	C448, 449	CERAMIC CAPACITOR	CKSQYF473Z25
	C450	CHIP CAPACITOR	CCSQCH100D50
	C451	CHIP CAPACITOR	CCSQCH270J50
	C452	ELECT. CAPACITOR	CEAS470M10

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	C456	CHIP CAPACITOR	CCSQCH101J50		C546	CHIP CAPACITOR	CCSQCH470J50
	C457	ELECT. CAPACITOR	CEAS101M10		C549	CHIP CAPACITOR	CCSQCH101J50
	C458-460	CHIP CAPACITOR	CKSQYF103Z50		C550	ELECT. CAPACITOR	CEAS101M10
	C461	CHIP CAPACITOR	CCSQCH101J50		C601	ELECT. CAPACITOR	CEAS221M6R3
	C462	CHIP CAPACITOR	CCSQCH330J50				
	C463	CHIP CERAMIC C.	CCSQCH271J50		C602	CERAMIC CAPACITOR	CKSQYF473Z25
	C464, 465	ELECT. CAPACITOR	CEAS470M10		C603	CHIP CAPACITOR	CCSQCH101J50
	C466, 467	CERAMIC CAPACITOR	CKSQYF473Z25		C604	AUDIO FILM CAPACITOR	CFTXA224J50
	C471	ELECT. CAPACITOR	CEAS010M50		C605	MYLAR FILM CAPACITOR	CQMA102J50
	C472	ELECT. CAPACITOR	CEAS3R3M50		C606		CFTXA821J50
	C473	CERAMIC CAPACITOR	CKSQYF473Z25		C607	MYLAR FILM CAPACITOR	CQMA102J50
	C474	AUDIO FILM CAPACITOR	CFTXA224J50		C608	MYLAR FILM CAPACITOR	CQMA152J50
	C475, 476	ELECT. CAPACITOR	CEAS3R3M50		C610	AUDIO FILM CAPACITOR	CFTXA563J50
	C477, 478	CERAMIC CAPACITOR	CKSQYF473Z25		C611	MYLAR FILM CAPACITOR	CQMA272J50
	C479, 480	CERAMIC CAPACITOR	CKSQYF104Z25		C612	ELECT. CAPACITOR	CEAS220M25
	C483	CERAMIC CAPACITOR	CKSQYF473Z25		C613	MYLAR FILM CAPACITOR	CQMA332J50
	C484	ELECT. CAPACITOR	CEAS470M25		C614	AUDIO FILM CAPACITOR	CFTXA103J50
	C485	CHIP CERAMIC C.	CCSQCH220J50		C615	AUDIO FILM CAPACITOR	CFTXA104J50
	C486	CHIP CAPACITOR	CKSQYF103Z50		C616	ELECT. CAPACITOR	CEANP2R2M50
	C487, 488	CERAMIC CAPACITOR	CKSQYF473Z25		C617	AUDIO FILM CAPACITOR	CFTXA393J50
	C489, 490	ELECT. CAPACITOR	CEAS101M10		C618	ELECT. CAPACITOR	CEANP220M10
	C496	CHIP CAPACITOR	CCSQCH390J50		C619	MYLAR FILM CAPACITOR	CQMA332J50
	C497	CHIP CAPACITOR	CCSQCH100D50		C620	MYLAR FILM CAPACITOR	CQMA222J50
	C498	CHIP CAPACITOR	CCSQCH820J50		C621	ELECT. CAPACITOR	CEAS477M50
	C499	ELECT. CAPACITOR	CEAS470M10		C622	ELECT. CAPACITOR	CEAS470M10
	C500	CHIP CAPACITOR	CCSQCH100D50		C623	CERAMIC CAPACITOR	CKSQYF473Z25
	C501, 502	ELECT. CAPACITOR	CEAS470M10		C624, 625	CHIP CAPACITOR	CCSQCH180J50
	C503-506	CERAMIC CAPACITOR	CKSQYF473Z25		C626, 627	CHIP CERAMIC C.	CCSQCH150J50
	C509	CHIP CAPACITOR	CCSQCH151J50		C628	CHIP CAPACITOR	CKSQYF103Z50
	C510	CHIP CAPACITOR	CCSQCH270J50		C629	CHIP CAPACITOR	CCSQCH180J50
	C511	CERAMIC CAPACITOR	CKSQYF104Z25		C641, 642	ELECT. CAPACITOR	CEAS470M10
	C512	ELECT. CAPACITOR	CEAS470M10		C643-646	CHIP CAPACITOR	CKSQYF103Z50
	C513	CERAMIC CAPACITOR	CKSQYF104Z25		C650	AUDIO FILM CAPACITOR	CFTXA103J50
	C514	AUDIO FILM CAPACITOR	CFTXA104J50		C651-653	CHIP CAPACITOR	CKSQYF103Z50
	C515	AUDIO FILM CAPACITOR	CFTXA683J50		C654	CHIP CAPACITOR	CCSQCH820J50
	C516	CHIP CERAMIC C.	CCSQCH220J50		C655	CHIP CAPACITOR	CCSQCH180J50
	C517	AUDIO FILM CAPACITOR	CFTXA683J50		C656, 657	MYLAR FILM CAPACITOR	CQMA272J50
	C521	ELECT. CAPACITOR	CEAS470M10		C658	CHIP CAPACITOR	CCSQCH101J50
	C522	ELECT. CAPACITOR	CEAS100M50		C659	CHIP CAPACITOR	CCSQCH180J50
	C524	CHIP CAPACITOR	CCSQCH390J50		C660	CHIP CAPACITOR	CCSQCH331J50
	C525	ELECT. CAPACITOR	CEAS470M10		C663	CERAMIC CAPACITOR	CKSQYF104Z25
	C526	CERAMIC CAPACITOR	CKSQYF104Z25		C670	ELECT. CAPACITOR	CEAS470M10
	C527	CERAMIC CAPACITOR	CKSQYF473Z25		C700	CHIP CAPACITOR	CCSQCH101J50
	C528	CHIP CAPACITOR	CCSQCH151J50		C735	CHIP CAPACITOR	CCSQCH390J50
	C529	CHIP CAPACITOR	CCSQCH910J50		C750	CHIP CAPACITOR	CCSQCH180J50
	C530	ELECT. CAPACITOR	CEANP100M16		C790	CHIP CAPACITOR	CCSQCH180J50
	C531	CERAMIC CAPACITOR	CKSQYF104Z25		C801-803	CHIP CAPACITOR	CKSQYF103Z50
	C533	ELECT. CAPACITOR	CEAS470M10		C804	CHIP CERAMIC C.	CCSQCH220J50
	C534	CERAMIC CAPACITOR	CKSQYF473Z25		C805	CERAMIC CAPACITOR	CKSQYF473Z25
	C535	CHIP CAPACITOR	CKSQYF103Z50		C806	CHIP CERAMIC C.	CCSQCH220J50
	C536	CHIP CAPACITOR	CCSQCH910J50		C807	AUDIO FILM CAPACITOR	CFTXA124J50
	C537	CAPACITOR(CERAMIC)	CKSYF105Z16		C808	ELECT. CAPACITOR	CEAS010M50
	C542	ELECT. CAPACITOR	CEAS221M6R3		C809	CHIP CAPACITOR	CCSQCH680J50
	C543	CERAMIC CAPACITOR	CKSQYF104Z25		C810, 811	CHIP CAPACITOR	CCSQCH101J50
	C544	CERAMIC CAPACITOR	CKSQYF473Z25		C812	CHIP CAPACITOR	CCSQCH270J50
	C545	CHIP CAPACITOR	CCSQCH680J50		C813	CHIP CAPACITOR	CCSQCH680J50
					C814	ELECT. CAPACITOR	CEANP010M50

Mark	No.	Description	Part No.
	C815	CHIP CAPACITOR	CCSQCH270J50
	C816	ELECT. CAPACITOR	CEAS010M50
	C817	CHIP CAPACITOR	CCSQCH050C50
	C818	CHIP CAPACITOR	CCSQL471J50
	C819	CHIP CAPACITOR	CCSQL561J50
	C820	CERAMIC CAPACITOR	CKSQYF473Z25
	C822	CHIP CAPACITOR	CCSQCH101J50
	C823	ELECT. CAPACITOR	CEAS010M50
	C824	CHIP CAPACITOR	CKSQYF103Z50
	C825	AUDIO FILM CAPACITOR	CFTXA682J50
	C827	AUDIO FILM CAPACITOR	CFTXA333J50
	C828, 829	CHIP CAPACITOR	CKSQYF103Z50
	C832	AUDIO FILM CAPACITOR	CFTXA104J50
	C834	MYLAR FILM CAPACITOR	CQMA152J50
	C835, 836	ELECTR. CAPACITOR	CEAL220M35
	C837	CERAMIC CAPACITOR	CCCSL331J50
	C838	AUDIO FILM CAPACITOR	CFTXA104J50
	C839	MYLAR FILM CAPACITOR	CQMA102J50
	C840	ELECTR. CAPACITOR	CEAL010M50
	C841	ELECT. CAPACITOR	CEAS220M35
	C842	ELECT. CAPACITOR	CEANP100M16
	C843	AUDIO FILM CAPACITOR	CFTXA223J50
	C845	ELECT. CAPACITOR	CEANP010M50
	C847	AUDIO FILM CAPACITOR	CFTXA683J50
	C848	AUDIO FILM CAPACITOR	CFTXA473J50
	C849	AUDIO FILM CAPACITOR	CFTXA103J50
	C850	ELECT. CAPACITOR	CEANP2R2M50
	C851	CERAMIC CAPACITOR	CKSQYF104Z25
	C852	FILM CAPACITOR	CFTNA224J50
	C853	MYLAR FILM CAPACITOR	CQMA332J50
	C854	CERAMIC CAPACITOR	CKSQYB821K50
	C855	ELECT. CAPACITOR	CEAS100M50
	C857	ELECT. CAPACITOR	CEAS221M6R3
	C858	CERAMIC CAPACITOR	CKSQYF104Z25
	C859	ELECT. CAPACITOR	CEAS221M6R3
	C860	CERAMIC CAPACITOR	CKSQYF104Z25
	C861	CHIP CAPACITOR	CKSQYF103Z50
	C863	ELECT. CAPACITOR	CEANP100M16
	C864	ELECT. CAPACITOR	CEAS100M50
	C865	AUDIO FILM CAPACITOR	CFTXA103J50
	C866	ELECT. CAPACITOR	CEANPR47M50
	C867	AUDIO FILM CAPACITOR	CFTXA333J50
	C868	AUDIO FILM CAPACITOR	CFTXA683J50
	C869	AUDIO FILM CAPACITOR	CFTXA473J50
	C870	ELECT. CAPACITOR	CEANP470M10
	C871	CERAMIC CAPACITOR	CCCSL331J50
	C873	AUDIO FILM CAPACITOR	CFTXA103J50
	C874	AUDIO FILM CAPACITOR	CFTXA104J50
	C875	CERAMIC CAPACITOR	CKSQYB562K50
	C876, 877	ELECTR. CAPACITOR	CEAL220M35
	C878	CERAMIC CAPACITOR	CKSQYF104Z25
	C879	CERAMIC CAPACITOR	CKSQYB562K50
	C880	CERAMIC CAPACITOR	CKSQYF104Z25
	C881, 882	CHIP CAPACITOR	CKSQYF103Z50
	C883	AUDIO FILM CAPACITOR	CFTXA823J50
	C890, 891	CHIP CAPACITOR	CCSQCH470J50

Mark	No.	Description	Part No.
	C893	CHIP CAPACITOR	CCSQCH470J50
	C895	CHIP CAPACITOR	CCSQCH100D50
	C896, 897	ELECT. CAPACITOR	CEAS470M10
	C898	MYLAR FILM CAPACITOR	CQMA472J50
	C899	MYLAR FILM CAPACITOR	CQMA272J50
	C900	FILM CAPACITOR	CFTNA224J50
	C901	AUDIO FILM CAPACITOR	CFTXA103J50
	C902	ELECT. CAPACITOR	CEAS100M50
	C908	CHIP CAPACITOR	CKSQYF103Z50
	C910	AUDIO FILM CAPACITOR	CFTXA473J50
	C920, 921	ELECT. CAPACITOR	CEAS220M25
	C930	ELECTR. CAPACITOR	CEAL220M35
	C935 (1F/5.5)		VCH1039
RESISTORS			
	R101-123	CHIP RESISTOR	RS1/10S□□□J
	R124-126	CARBONFILM RESISTOR	RD1/6PM□□□J
	R127-129	CHIP RESISTOR	RS1/10S□□□J
	R130	CARBONFILM RESISTOR	RD1/6PM□□□J
	R150-153	CHIP RESISTOR	RS1/10S□□□J
	R201-203	CARBONFILM RESISTOR	RD1/6PM□□□J
	R204-206	CHIP RESISTOR	RS1/10S□□□J
	R207, 208	CARBONFILM RESISTOR	RD1/6PM□□□J
	R321-326	CHIP RESISTOR	RS1/10S□□□J
	R401, 402	CHIP RESISTOR	RS1/10S□□□J
	R403	CARBONFILM RESISTOR	RD1/6PM□□□J
	R411-413	CHIP RESISTOR	RS1/10S□□□J
	R415, 416	METALFILM RESISTOR	RN1/6PQ□□□□F
	R431	CARBONFILM RESISTOR	RD1/6PM□□□J
	R432	CHIP RESISTOR	RS1/10S□□□J
	R434	METALFILM RESISTOR	RN1/6PQ□□□□F
	R435-437	CHIP RESISTOR	RS1/10S□□□J
	R438	METALFILM RESISTOR	RN1/6PQ□□□□F
	R439-441	CHIP RESISTOR	RS1/10S□□□J
	R442	CARBONFILM RESISTOR	RD1/6PM□□□J
	R443, 444	CHIP RESISTOR	RS1/10S□□□J
	R456-459	CHIP RESISTOR	RS1/10S□□□J
	R471-476	CHIP RESISTOR	RS1/10S□□□J
	R496-504	CHIP RESISTOR	RS1/10S□□□J
	R506, 507	CHIP RESISTOR	RS1/10S□□□J
	R511	METALFILM RESISTOR	RN1/6PQ□□□□F
	R512-519	CHIP RESISTOR	RS1/10S□□□J
	R521-533	CHIP RESISTOR	RS1/10S□□□J
	R550	FUSE RESISTOR	DCN1002
	R551	CARBONFILM RESISTOR	RD1/6PM□□□J
	R560, 561	CHIP RESISTOR	RS1/10S□□□J
	R571-573	CHIP RESISTOR	RS1/10S□□□J
	R601, 602	CHIP RESISTOR	RS1/10S□□□J
	R603	CARBONFILM RESISTOR	RD1/6PM□□□J
	R604-612	CHIP RESISTOR	RS1/10S□□□J
	R614-617	CHIP RESISTOR	RS1/10S□□□J
	R618	CARBONFILM RESISTOR	RD1/6PM□□□J
	R619-623	CHIP RESISTOR	RS1/10S□□□J
	R625-628	CHIP RESISTOR	RS1/10S□□□J
	R629	CARBONFILM RESISTOR	RD1/6PM□□□J
	R630-644	CHIP RESISTOR	RS1/10S□□□J

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	R646	CHIP RESISTOR	RS1/10S□□□J		VR521	VR	VRTG6VS472
	R647	CARBONFILM RESISTOR	RD1/6PM□□□J		VR601	VR	VRTB6VS102
	R648, 649	CHIP RESISTOR	RS1/10S□□□J		VR602, 603	SEMI-FIXED RESISTOR	VRTB6VS103
	R650	CARBONFILM RESISTOR	RD1/6PM□□□J				
	R652, 653	CHIP RESISTOR	RS1/10S□□□J		VR604	VR	VRTB6VS472
	R661, 662	CHIP RESISTOR	RS1/10S□□□J		VR605, 606	VR	VRTB6VS222
	R665-678	CARBONFILM RESISTOR	RD1/6PM□□□J		VR607	VR	VRTB6VS223
	R680-683	METALFILM RESISTOR	RN1/6PQ□□□□F		VR608	VARIABLE RESISTOR	VRTB6VS333
	R684-689	CHIP RESISTOR	RS1/10S□□□J		VR609	VR	VRTB6VS472
					VR610	SEMI-FIXED RESISTOR	VRTB6VS103
	R691	CARBONFILM RESISTOR	RD1/6PM□□□J	OTHERS			
	R692	CHIP RESISTOR	RS1/10S□□□J		CN103		VKN1137
	R700	CHIP RESISTOR	RS1/10S□□□J		JA1	2P PINJACK	VKB1042
	R701	CARBONFILM RESISTOR	RD1/6PM□□□J		JA2	JACK	VKN-183
	R702-708	CHIP RESISTOR	RS1/10S□□□J		VC901	VARIABLE CAPACITOR	VCN-008
					X101	CERAMIC RESONATOR	VSS1040
	R709	CARBONFILM RESISTOR	RD1/6PM□□□J				
	R712-714	CHIP RESISTOR	RS1/10S□□□J		X601	CRYSTAL RESONATOR	VSS1026
	R721-723	CHIP RESISTOR	RS1/10S□□□J	FG BOARD ASSEMBLY			
	R750	CHIP RESISTOR	RS1/10S□□□J				
	R790	CHIP RESISTOR	RS1/10S□□□J	OTHERS			
					D		GP1S51
	R802-829	CHIP RESISTOR	RS1/10S□□□J	SW BOARD ASSEMBLY			
	R832	CARBONFILM RESISTOR	RD1/6PM□□□J				
	R833-840	CHIP RESISTOR	RS1/10S□□□J	SWITCHES			
	R841, 842	CARBONFILM RESISTOR	RD1/6PM□□□J		S1-3	PUSH SWITCH	DSG1015
	R843-848	CHIP RESISTOR	RS1/10S□□□J	KAUB ASSEMBLY			
				SEMICONDUCTORS			
	R850	METAL OXIDE RESISTOR	RS1LMF□□□J		IC101-103	OP-AMP IC	RC4558D
	R853, 854	CHIP RESISTOR	RS1/10S□□□J		IC104		YSS205
	R856	CHIP RESISTOR	RS1/10S□□□J		IC105	PSEUDO-SRAM(32KX8)	LH5P832N-12
	R858-860	CHIP RESISTOR	RS1/10S□□□J		IC106		BU4066BF
	R862	METAL OXIDE RESISTOR	RS1LMF□□□J		IC107	LOGIC IC	BU4053BF
	R865-870	CHIP RESISTOR	RS1/10S□□□J		IC108, 109	OP-AMP IC	RC4558D
	R872	CHIP RESISTOR	RS1/10S□□□J		IC201	EFM DEMODULATION IC	CXD2500AQ
	R873	CARBONFILM RESISTOR	RD1/6PM□□□J		IC202	REGULATOR IC	NJM78M08FA
	R875-897	CHIP RESISTOR	RS1/10S□□□J		IC203	REGULATOR IC	NJM79M08FA
	R899-909	CHIP RESISTOR	RS1/10S□□□J		IC204	IC	BA15218N
	R910-913	CARBONFILM RESISTOR	RD1/6PM□□□J		IC205	DATA SELECTOR	TC74HC157AF
	R914, 915	CHIP RESISTOR	RS1/10S□□□J		IC206	D/A CONVERTER IC	PD2026A
	R916, 917	CARBONFILM RESISTOR	RD1/6PM□□□J		IC207-209	OP-AMP, IC	M5218AP
	R918-922	CHIP RESISTOR	RS1/10S□□□J		IC351		CA0002AM
	R923	CARBONFILM RESISTOR	RD1/6PM□□□J		Q101	DIGITAL TRANSISTOR	DTA124EK
	R925-932	CHIP RESISTOR	RS1/10S□□□J		Q102, 103		DTA124EK
	R934	CARBONFILM RESISTOR	RD1/6PM□□□J		Q104, 105	TRANSISTOR	2SD2144S
	R935-938	CHIP RESISTOR	RS1/10S□□□J		Q201	CHIP TRANSISTOR	2SC2412K
	R940-947	CHIP RESISTOR	RS1/10S□□□J		Q202, 203	DIGITAL TRANSISTOR	DTA124EK
	R948	CARBONFILM RESISTOR	RD1/6PM□□□J		Q204, 205	TRANSISTOR	2SD2144S
	R949-951	CHIP RESISTOR	RS1/10S□□□J		Q206		DTA124EK
	R955-957	CHIP RESISTOR	RS1/10S□□□J		Q207	DIGITAL TRANSISTOR	DTA124EK
	R959	CHIP RESISTOR	RS1/10S□□□J		Q208-210		DTA124EK
	R961	CHIP RESISTOR	RS1/10S□□□J		Q351	TRANSISTOR	2SC2786
	R962	CARBONFILM RESISTOR	RD1/6PM□□□J		Q352	CHIP TRANSISTOR	2SC2412K
	R964	CHIP RESISTOR	RS1/10S□□□J		D101, 102	DIODE	1SS254
	R966-969	CHIP RESISTOR	RS1/10S□□□J		D103, 104	ZENER DIODE	MTZJ5.6B
	R975-983	CHIP RESISTOR	RS1/10S□□□J		D105	ZINER DIODE	MTZJ5.1A
	R985	CARBONFILM RESISTOR	RD1/6PM□□□J				
	R986-991	CHIP RESISTOR	RS1/10S□□□J				
	VR441	SEMI-FIXED RESISTOR	VRTB6VS103				
	VR481, 482	VR	VRTB6VS472				

Mark	No.	Description	Part No.
		D106, 107 DIODE	1SS254
		D201 VARI-CAP	PC54M
		D202 DIODE	1SS254
SWITCHES			
		S201 SLIDE SWITCH	VSH1007
COILS/TRANSFORMERS			
		L101, 102 AXIAL INDUCTOR	LAU100K
		L201, 202 AXIAL INDUCTOR	LAU010K
		L203 AXIAL INDUCTOR	LAU220K
		L204 AXIAL INDUCTOR	LAU101K
		L351 AXIAL INDUCTOR	LAU100K
		F351	VTF1048
		F352	VTF1049
CAPACITORS			
		C101, 102 CHIP CAPACITOR	CKSQYF103Z50
		C103 MYLAR FILM CAPACITOR	CQMA472J50
		C104 MYLAR FILM CAPACITOR	CQMA223J50
		C105 CHIP CAPACITOR	CCSQCH181J50
		C106 ELECT. CAPACITOR	CEAS4R7M50
		C107 MYLAR FILM CAPACITOR	CQMA392J50
		C108 MYLAR FILM CAPACITOR	CQMA822J50
		C109 CHIP CAPACITOR	CCSQL331J50
		C110 MYLAR FILM CAPACITOR	CQMA103J50
		C111 CHIP CAPACITOR	CCSQCH151J50
		C112, 113 CHIP CAPACITOR	CKSQYF103Z50
		C114 ELECT. CAPACITOR	CEAS4R7M50
		C115 MYLAR FILM CAPACITOR	CQMA392J50
		C116 MYLAR FILM CAPACITOR	CQMA822J50
		C117 CHIP CAPACITOR	CCSQL331J50
		C118 MYLAR FILM CAPACITOR	CQMA103J50
		C119 CHIP CAPACITOR	CCSQCH151J50
		C120, 121 CHIP CAPACITOR	CKSQYF103Z50
		C122 ELECT. CAPACITOR	CEAS4R7M50
		C123, 124 ELECT. CAPACITOR	CEAS101M10
		C125-127 MYLAR FILM CAPACITOR	CQMA332J50
		C128 ELECT. CAPACITOR	CEAS101M10
		C129, 130 CERAMIC CAPACITOR	CKSQYF104Z25
		C131 CHIP CAPACITOR	CKSQYF103Z50
		C132-134 CERAMIC CAPACITOR	CKSQYF104Z25
		C135 ELECT. CAPACITOR	CEAS101M10
		C136 CERAMIC CAPACITOR	CKSQYF104Z25
		C137, 138 CHIP CAPACITOR	CKSQYF103Z50
		C139, 140 ELECT. CAPACITOR	CEANP100M16
		C141-144 CHIP CAPACITOR	CKSQYF103Z50
		C145, 146 ELECT. CAPACITOR	CEANP010M50
		C147, 148 CHIP CAPACITOR	CKSQYF103Z50
		C149, 150 ELECT. CAPACITOR	CEAS100M50
		C151 CHIP CAPACITOR	CCSQCH121J50
		C152 CERAMIC CAPACITOR	CKSQYB822K50
		C153 AUDIO FILM CAPACITOR	CFTXA104J50
		C154 ELECT. CAPACITOR	CEANP100M16
		C155 MYLAR FILM CAPACITOR	CQMA472J50
		C156 ELECT. CAPACITOR	CEANP100M16
		C157 CHIP CAPACITOR	CKSQYF103Z50

Mark	No.	Description	Part No.
		C201 CERAMIC CAPACITOR	CKSQYF473Z25
		C202 CERAMIC CAPACITOR	CKSQYB152K50
		C204 CERAMIC CAPACITOR	CKSQYF104Z25
		C205 FILM CAPACITOR	CFTNA474J50
		C206 CHIP CAPACITOR	CKSQYF103Z50
		C208 ELECT. CAPACITOR	CEAS470M10
		C209 CERAMIC CAPACITOR	CKSQYF104Z25
		C210 CERAMIC CAPACITOR	CKSQYF473Z25
		C211 ELECT. CAPACITOR	CEAS470M10
		C212 CERAMIC CAPACITOR	CKSQYF104Z25
		C213 CHIP CAPACITOR	CKSQYF103Z50
		C220 CHIP CERAMIC C.	CCSQCH220J50
		C225 ELECT. CAPACITOR	CEANP010M50
		C226 MYLAR FILM CAPACITOR	CQMA223J50
		C227 ELECT. CAPACITOR	CEAS100M50
		C228, 229 CERAMIC CAPACITOR	CKSQYF104Z25
		C230 ELECT. CAPACITOR	CEAS470M10
		C231 CHIP CAPACITOR	CKSQYF103Z50
		C232 CHIP CAPACITOR	CCSQCH120J50
		C234 CHIP CAPACITOR	CKSQYF103Z50
		C241 ELECT. CAPACITOR	CEAS221M25
		C242 ELECT. CAPACITOR	CEAS470M10
		C243 ELECT. CAPACITOR	CEAS221M25
		C244 ELECT. CAPACITOR	CEAS470M10
		C245, 246 CHIP CAPACITOR	CKSQYF103Z50
		C247, 248 ELECT. CAPACITOR	CEAS470M10
		C250 CHIP CAPACITOR	CKSQYF103Z50
		C252 AUDIO FILM CAPACITOR	CFTXA104J50
		C253 ELECT. CAPACITOR	CEAS470M10
		C254 CERAMIC CAPACITOR	CKSQYF104Z25
		C255 AUDIO FILM CAPACITOR	CFTXA104J50
		C256 ELECT. CAPACITOR	CEAS471M6R3
		C257 AUDIO FILM CAPACITOR	CFTXA104J50
		C258-263 CHIP CAPACITOR	CCSQCH390J50
		C264, 265 CHIP CERAMIC C.	CCSQCH221J50
		C266, 267 MYLAR FILM CAPACITOR	CQMA102J50
		C268, 269 CHIP CAPACITOR	CCSQCH151J50
		C270-273 ELECT. CAPACITOR	CEAS470M10
		C274, 275 ELECT. CAPACITOR	CEANP220M10
		C276, 277 ELECT. CAPACITOR	CEAS470M10
		C284-287 CHIP CAPACITOR	CCSQL331J50
		C288 CHIP CAPACITOR	CKSQYF103Z50
		C291, 292 CERAMIC CAPACITOR	CKSQYF104Z25
		C299 ELECT. CAPACITOR	CEANP3R3M50
		C351 CHIP CAPACITOR	CCSQL391J50
		C352, 353 CHIP CAPACITOR	CKSQYF103Z50
		C354 ELECT. CAPACITOR	CEAS470M10
		C355-358 MYLAR FILM CAPACITOR	CQMA472J50
		C359, 360 FILM CAPACITOR	CFTNA224J50
		C361, 362 MYLAR FILM CAPACITOR	CQMA393J50
		C363 ELECT. CAPACITOR	CEAS470M10
		C364 ELECT. CAPACITOR	CEAS101M10
		C365, 366 AUDIO FILM CAPACITOR	CFTXA104J50
		C367 ELECT. CAPACITOR	CEAS100M50
		C368 ELECT. CAPACITOR	CEASR47M50
		C369 ELECT. CAPACITOR	CEAS470M10

Mark	No.	Description	Part No.
	C371-373	CERAMIC CAPACITOR	CKSQYF104Z25
	C391	CHIP CAPACITOR	CKSQYB102K50
RESISTORS			
	R101-159	CHIP RESISTOR	RS1/10S□□□J
	R201-207	CHIP RESISTOR	RS1/10S□□□J
	R210-221	CHIP RESISTOR	RS1/10S□□□J
	R222, 223	CARBONFILM RESISTOR	RD1/6PM□□□J
	R225-233	CHIP RESISTOR	RS1/10S□□□J
	R236-238	CHIP RESISTOR	RS1/10S□□□J
	R240, 241	CHIP RESISTOR	RS1/10S□□□J
	R243, 244	CHIP RESISTOR	RS1/10S□□□J
	R245	CARBONFILM RESISTOR	RD1/6PM□□□J
	R246, 247	CHIP RESISTOR	RS1/10S□□□J
	R250-258	CHIP RESISTOR	RS1/10S□□□J
	R259-268	CARBONFILM RESISTOR	RD1/6PM□□□J
	R271-274	CARBONFILM RESISTOR	RD1/6PM□□□J
	R275-280	CHIP RESISTOR	RS1/10S□□□J
	R281-283	CARBONFILM RESISTOR	RD1/6PM□□□J
	R284, 285	CHIP RESISTOR	RS1/10S□□□J
	R290, 291	CARBONFILM RESISTOR	RD1/6PM□□□J
	R294	CHIP RESISTOR	RS1/10S□□□J
	R310, 311	CHIP RESISTOR	RS1/10S□□□J
	R312, 313	FUSE RESISTOR	DCN1002
	R314	CHIP RESISTOR	RS1/10S□□□J
	R351-357	CHIP RESISTOR	RS1/10S□□□J
	R358	CARBONFILM RESISTOR	RD1/6PM□□□J
	R359-361	CHIP RESISTOR	RS1/10S□□□J
	R362	CARBONFILM RESISTOR	RD1/6PM□□□J
	R363-371	CHIP RESISTOR	RS1/10S□□□J
OTHERS			
	CN301		B5P-SHF-1AA
	JA201 JACK		VKB1043
	X201 CRYSTAL RESONATOR		VSS1057
EXTB ASSEMBLY			
CAPACITORS			
	C401, 402	CHIP CAPACITOR	CCSQSL331J50
OTHERS			
	JA401 JACK		VKB1022
FLKB ASSEMBLY			
SEMICONDUCTORS			
	IC101 IC		TC35097AP
	IC102 MODE CONTROL MCU		PDB070A
	IC103 RESET IC		PST529D
	IC104 I/O EXPANDER IC		BU2040F
	IC105 OP-AMP IC		RC4558D
	Q101 TRANSISTOR		DTC114ES
	Q102 TRANSISTOR		DTA144ES
	D101-111 DIODE		1SS252
	D112-121 LED		VEL1017
	D126 DIODE		1SS252
SWITCHES			
	S101-111 SWITCH		RSG1030
	S112 DOOR SWITCH		VSK1015

Mark	No.	Description	Part No.
	S113	SLIDE SWITCH	VSH1005
CAPACITORS			
	C101	ELECT. CAPACITOR	CEJA100M50
	C102	CERAMIC CAPACITOR	CKPUYY103N16
	C103	ELECT. CAPACITOR	CEJA101M6R3
	C104	CERAMIC CAPACITOR	CKPUYF223Z25
	C105	ELECT. CAPACITOR	CEJA100M16
	C106	CERAMIC CAPACITOR	CKPUYB102K50
	C107, 108	ELECT. CAPACITOR	CEJA220M6R3
	C109	CERAMIC CAPACITOR	CKPUYY103N16
	C110	ELECT. CAPACITOR	CEJA470M6R3
	C111	CERAMIC CAPACITOR	CKPUYY103N16
	C112	FILM CAPACITOR	CFTNA683J50
	C113	CERAMIC CAPACITOR	CKPUYB151K50
	C114, 115	CERAMIC CAPACITOR	CKPUYY103N16
	C116	AXIAL CAPACITOR	CKPUYB221K50
RESISTORS			
	R101-105	CARBONFILM RESISTOR	RD1/6PM□□□J
	R108-110	CARBONFILM RESISTOR	RD1/6PM□□□J
	R111	RESISTOR ARRAY	RA4T□□□J
	R112-127	CARBONFILM RESISTOR	RD1/6PM□□□J
	R129	CARBONFILM RESISTOR	RD1/6PM□□□J
	R131-133	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR101, 102	ROTARY VR	VCS1028
	VR103, 104	ROTARY VR	VCS1024
OTHERS			
	FL SPACER		VEB1159
	CN103		BTMK07S-1S
	CN104		BTMK09S-1S
	V101 FL TUBE		VAW1024
	X101 CERAMIC RESONATOR		VSS1055
DIKB ASSEMBLY			
SWITCHES			
	S301-320	SWITCH	RSG1030
IRKB ASSEMBLY			
SWITCHES			
	S401	SWITCH	RSG1030
OTHERS			
	REMOTE SENSOR		HC-177
KCKB ASSEMBLY			
SWITCHES			
	S701-704	SWITCH	RSG1030
CNCB ASSEMBLY			
RESISTORS			
	R801	RESISTOR ARRAY	RAST□□□J
	R802	CARBONFILM RESISTOR	RD1/6PM□□□J

D-2710K

Mark	No.	Description	Part No.
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MIJB ASSEMBLY

SEMICONDUCTORS

IC601			NJM2068D
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CAPACITORS

C601, 602 CERAMIC CAPACITOR			CKPUYF223Z25
C603 MYLAR FILM CAPACITOR			CQMA152J50
C604 ELECT. CAPACITOR			CEJA2R2M50
C605 AXIAL CAPACITOR			CKPUYB681K50
C606, 607 CERAMIC CAPACITOR			CKPUYB102K50
C609 MYLAR FILM CAPACITOR			CQMA152J50
C610 ELECT. CAPACITOR			CEJA2R2M50
C611 AXIAL CAPACITOR			CKPUYB681K50

RESISTORS

R601-606 CARBONFILM RESISTOR			RD1/6PM□□□J
R608-611 CARBONFILM RESISTOR			RD1/6PM□□□J

OTHERS

JA601 MIC JACK			VNE1102
JA602 HEADPHONE JACK			VKN1147
JA603 MIC JACK			RKN1006
			VKN1147

HEPB ASSEMBLY

CAPACITORS

C501, 502 AXIAL CAPACITOR			CKPUYB101K50
C503 CERAMIC CAPACITOR			CGCYX473K25

RESISTORS

VR501 ROTARY VR			VCS1020
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OTHERS

SNAP PLATE			VNE1102
JA501 JACK			RKN1002

POWER SUPPLY BOARD ASSEMBLY

SEMICONDUCTORS

IC202			TH5P4-FU
IC211, 212 IC PROTECTOR			ICP-N20
IC213, 214 IC PROTECTOR			ICP-N50
IC215 IC PROTECTOR			ICP-N38
Q201 TRANSISTOR			2SB1331

Q202 TRANSISTOR			2SC1740S
Q205, 206 TRANSISTOR			2SA933S
Q207 TRANSISTOR			2SD1762
D201, 202 DIODE			S3LA20
D203 DIODE			S3S4M

D204 DIODE			ERB83-006
D205 DIODE			D1NL20
D206 ZENER DIODE			MTZJ2. 4A
D207 ZENER DIODE			MTZJ3. 3A
D208 ZENER DIODE			MTZJ5. 6C

D209, 210 DIODE			D1NL20
D213-215 DIODE			D1NL20

COILS/TRANSFORMERS

L203 SPDL CHOKE COIL			VTL1043
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Mark	No.	Description	Part No.
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CNNB ASSEMBLY

SWITCHES

S201			VSK1017
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RESISTORS

R101, 102 CARBONFILM RESISTOR			RD1/6PM□□□J
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OTHERS

CN204			VKN1139
CN203			VKN1138

HEAD ASSEMBLY

CAPACITORS

C3 CHIP CAPACITOR			CKSQYF223Z50
C4 CHIP CAPACITOR			CKSQYF104Z25
C5 CHIP CAPACITOR			CKSYF105Z16
C6 CHIP CAPACITOR			CKSQYF104Z25

RESISTOR

VR1 SEMI-FIXED VR(10kΩ)			VCP1025
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6. ADJUSTMENTS

(1) JIGS AND INSTRUMENTS REQUIRED FOR ADJUSTMENT

- Small screwdriver (about 10cm long)
- Small Phillips screwdriver (about 7cm long)
- Phillips screwdriver
- Dual-trace oscilloscope (with delay)
- AF oscillator
- Frequency counter
- LD test disc (GGV1003)
- CD test disc (YEDS - 7)
- Digital voltmeter
- Shorting clip
- L - shaped eccentric screwdriver (GGV - 129)
- TV monitor
- Resistor ($47k\Omega$, $10k\Omega \times 2$, 75Ω)
- Low-pass filter ($47k\Omega + 1\mu F$)

(2) TEST MODE

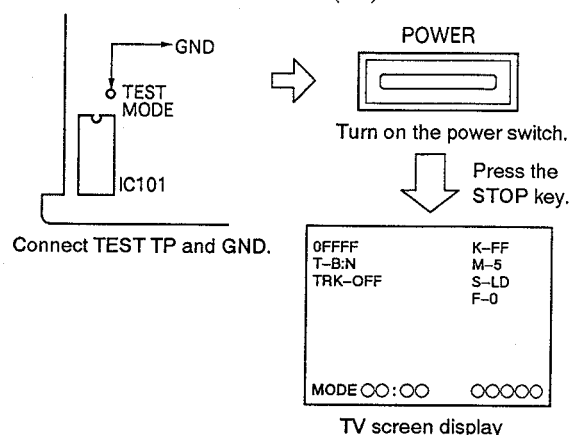
The player has a test mode function which allows the servicer to check the player's status on the TV screen by executing the respective key operation.

Also, since the TRKG servo opens and closes easily, the test mode is especially useful for mechanical adjustments.

TEST MODE INITIATION

[Procedure]

1. Remove the bonnet and disc tray.
2. Connect the TEST MODE (TP) to GND.
3. Turn on the power switch.
4. Disconnect the TEST MODE (TP) from GND.



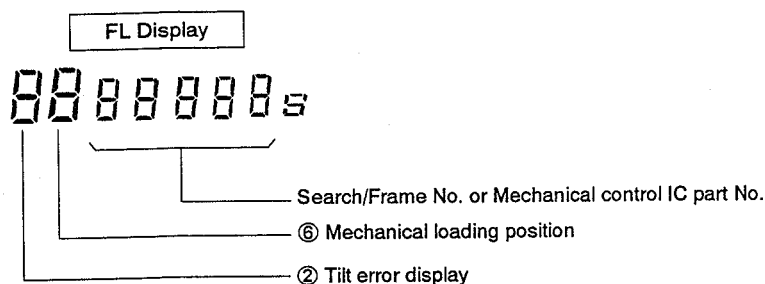
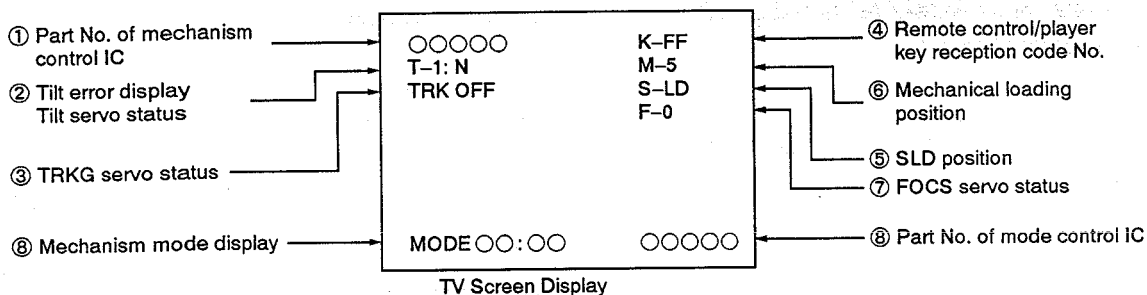
Note: When using the remote control unit (GGF1067) for the test mode.

- Press the **TEST** key after pressing the **ESC** key.

TEST MODE CANCELLATION

Turn off the power switch.

(3) TV SCREEN AND FL DISPLAYS IN THE TEST MODE



① The Mechanical Control IC Part No. will be Displayed.

Example: PD0081A1 → 0081A
 PD0081B1 → 0081B
 PD0123A1 → 0123A

② Tilt Servo Status / Tilt Error Display

T-○:○○

↑ Tilt servo status : N ...Tilt neutral
 ON ...Tilt servo ON
 OFF...Tilt servo OFF

↑ Tilt error display: 0 Tilt -
 ↑ Tilt neutral
 F Tilt +

③ TRKG Servo Status

TV screen display
 TRK-○○○

↑ ON...TRKG servo close
 OFF...TRKG servo open

④ Remote Control/Player Key Reception Code No.

TV screen display
 K-○○

↑ See table 1

Code	Function	Code	Function	Code	Function	Code	Function
00	0	20	F JOG0	40	(CHAP / TRK)	60	
01	1	21	F JOG1	41	(FRAM / TIM)	61	
02	2	22	F JOG2	42	(SEARCH)	62	
:	:	:	:	:	:	:	
1C	POW ON/OFF	3C		5C		7C	
1D	EDIT	3D		5D		7D	
1E	AUDIO	3E		5E	RNDM (TEST)	7E	
1F	+10	3F		5F	(ESC)	7F	

Table 1 Example of Code

⑤ SLDR Position

TV screen display	FL display	Mode
S-○○○ ↑ IN	—	CD inside SW ON
CD	CD	CD active area
CDV	CDV	CDV active area
LD	LD	LD active area
B IN	—	LD B inside SW ON

⑥ Mechanical Loading Position

TV screen display

- M-○
 ↑
 0 ... Tray open
 1 ... Loading
 2 ... Standby
 3 ... Clamped
 5 ... Tilt minus
 7 ... Tilt plus
 8 ... Tilt limit
 9 ... B side clamped (two sides)

⑦ Focus Offset VR Status

TV screen display

- F-○
 ↑
 0 ... Normal mode
 TRKG close : VR606 (RF MAX)
 TRKG open : VR605 (TE MAX)
 1 ... VR606 is activated when opening the
 TRKG servo loop.

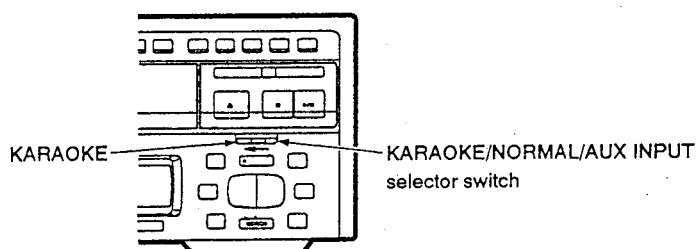
⑧ The mode control IC part No. will be displayed.

Example PDB056A → B056A

(4) KEY OPERATION IN THE TEST MODE

Function	Player Status	Key Operation	Remarks
Open Tray	STOP mode	▲	
Close Tray	Tray open	▲	
Stop	PLAY mode	■	
Play	Disc placement and tray closed.	▶	- Start play with the TRKG servo open. - Raise up with tilt neutral. - The disc type (LD/CD/CDV) is determined when playback starts at the SLDR position during start play.
TRKG Servo Open/Close	PLAY mode	▶	Each time the PLAY button (▶) is pressed, the TRKG servo will open or close alternately.
Still	PLAY mode TRKG servo closed.	▢ (Remote control unit key)	Each time the STILL button (▢) is pressed, the player will switch between the PLAY and STILL modes alternately.
SLDR REV SCAN	PLAY mode	◀◀	- Press and hold down the key. - With the TRKG servo open, the pickup can be damaged if the SLDR moves further inward than the lead-in area on the disc. Do not allow the SLDR to move further inward than the lead-in area.
SLDR FWD SCAN	PLAY mode	▶▶	- Press and hold down the key. - With the TRKG servo open, the pickup can be damaged if the SLDR moves further outward than the lead-in area on the disc. Do not allow the SLDR to move further outward than the lead-in area.
TILT Neutral	POWER switch ON	* H (KEY CONTROL key)	
TILT Servo ON	PLAY mode	* # (KEY CONTROL key)	
TILT Minus TILT Servo OFF	PLAY mode	◀◀	Press and hold down the keys.
TILT Plus TILT Servo OFF	PLAY mode	▶▶	Press and hold down the keys.
Screen Display ON / OFF	POWER switch ON	PGM key	
Frame search	PLAY mode	+10 key ↓ 0-9 key ↓ ▶	- In the PLAY mode, press the +10 key. (The player will standby for the frame No. entry.) - Use the numeric keys(0—9) to enter the frame No.. Then press the player's PLAY key to search. - After the search is completed, the player will return to the operation mode before the search was performed.
Loading Motor Rotation Clockwise Counterclockwise	Tray open	◀◀ ▶▶	- FWD: Unloading - REV: Loading
Focus Offset (CT MAX) for Checking VR606	PLAY mode TRKG servo open	* b (KEY CONTROL key) (toggle)	VR606 and VR605 : For check F-0 : Normal state ----- TRKG close : VR606 (CT BEST) TRKG open : VR605 (TE MAX) F-1 : VR606 is activated when opening the TRKG.

* Perform key operation by setting the KARAOKE/NORMAL/AUX INPUT selector switch, on the front panel, to the KARAOKE position.

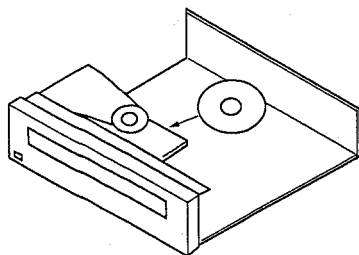


(5) PLAYER OPERATION IN THE TEST MODE

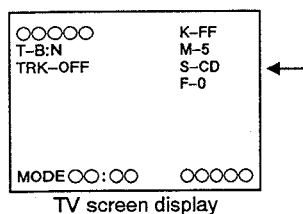
Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

● CD PLAYBACK

- ① Place the CD disc on the turn table.
(Clamper is already lifted up.)



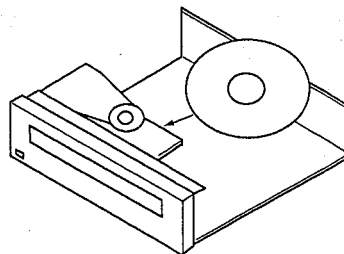
- ② Press the or key to appear "S-CD" on the TV screen display.



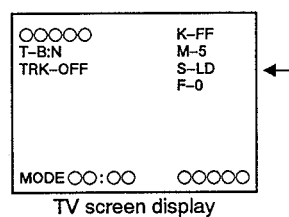
- ③ Clamp the disc by pressing the PLAY () key once.
Then, press the PLAY () key twice, disc will be normal playbacked.

● LD PLAYBACK

- ① Place the LD disc on the turn table.
(Clamper is already lifted up.)



- ② Press the or key to appear "S-LD" on the TV screen display.



- ③ Clamp the disc by pressing the PLAY () key once.
Then, press the PLAY () key twice, disc will be normal playbacked.

(6) PREPARATIONS FOR ADJUSTMENT AND PRECAUTIONS

1) When replacing the pickup assembly, adjust in the following way:

– Carriage assembly in forward state–

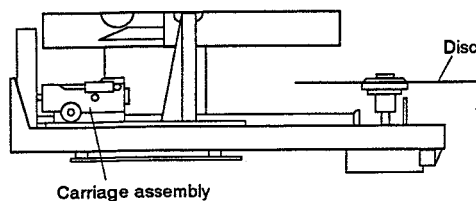
1. Tilt offset adjustment
2. Tilt servo gain adjustment
3. Coarse grating adjustment, tracking balance adjustment
4. Slider shaft horizontal adjustment
5. Pickup inclination adjustment
6. TRKG error MAX. / crosstalk MAX. adjustment
7. Tilt sensor inclination/tilt balance adjustment
8. Spindle motor centering check
9. Spindle motor centering adjustment
10. Fine grating adjustment
11. FOCS SUM level adjustment
12. FOCS servo loop gain adjustment
13. TRKG servo loop gain adjustment
14. RF gain adjustment

– Carriage assembly in reverse state–

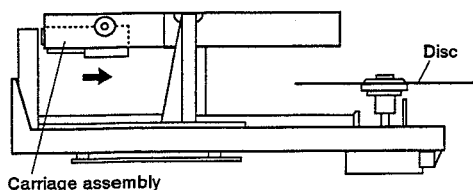
15. Coarse centering adjustment for side B play
16. Pickup tangential direction angle adjustment for side B play
17. Fine centering adjustment for side B play

Note : The forward status of carriage assembly is when the carriage assembly is in the position to play side A of the disc. The reverse status is when it is in the position to play side B of the disc.

Carriage assembly forward state



Carriage assembly reverse state

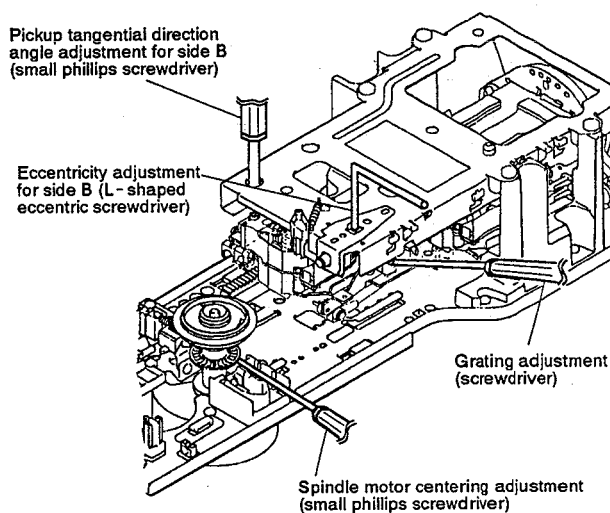


2) Side B play

Direct side B play is possible by pressing the SIDE B key of the front panel.

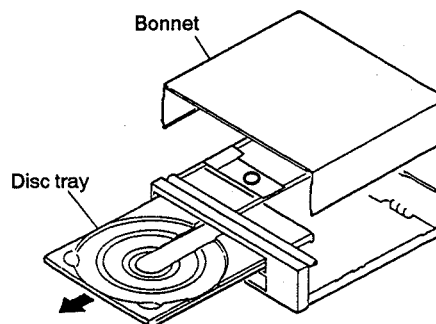
3) Where to insert the screwdriver when adjusting the pickup assembly

– Carriage assembly in forward state–



4) Setting the player

Adjustment should be performed with the bonnet, disc tray and KAUB assembly removed.



5) Installing the disc

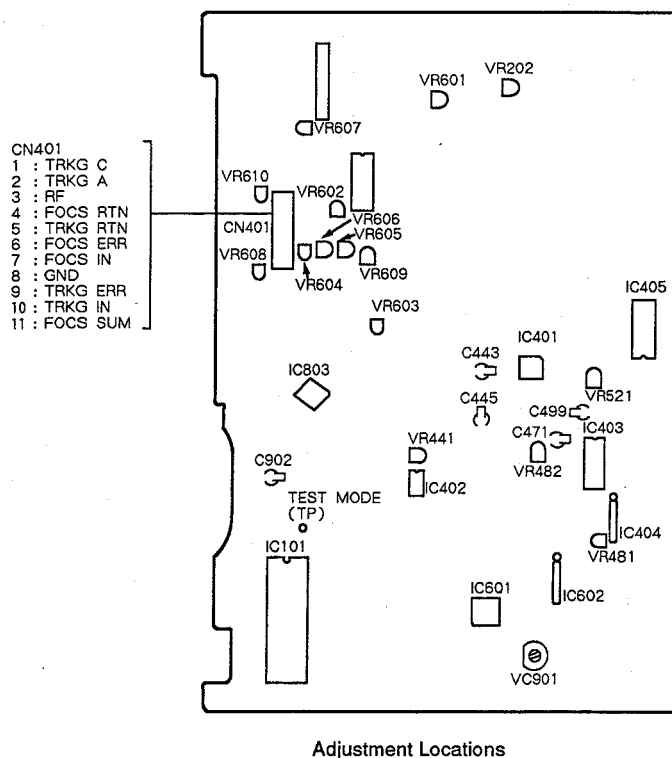
The disc should be placed from behind on the turntable and when Open/Close key is pressed, the clamper comes down to clamp the disc.

(7) MAIN BOARD ASSEMBLY ADJUSTMENT SUMMARY

	ADJUSTMENT	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
1	Tilt Offset Adjustment	VR610	C902 - (minus) lead wire	• Stop mode (power on)	• Adjust VR610 so that the DC voltage becomes $0 \pm 0.2V$.
2	Tilt Servo Gain Adjustment	VR608	None	• Power OFF	• Making of Tilt gain VR position Red : Turn to right Clear : Center Blue : Turn to left
3	Coarse Grating and Tracking Balance Adjustment	Grating / VR602	CN401-9 (TRKG ERR)	• Test mode #6,500 still TRKG servo open • Tilt servo NEUTRAL	• Null point → TRK error MAX • Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal.
4	Slider Shaft Horizontal Adjustment	SKIP key	CN401-4 (FOCS RTN)	• Test mode #9,800 , #22,000-25,000 still TRKG servo open • TILT servo OFF	• Adjust the SKIP key so that the FOCS RTN voltage between #9,800 and #22,000-25,000 becomes equal.
5	Pickup Inclination Adjustment	Pickup assembly TAN / TRK inclination adjustment screw	CN401-3 (RF)	• Test mode , #2,701 still TRKG servo loop close • TILT servo OFF	• RF waveform's amplitude MAX (Pickup TAN / TRK adjustment screw) • Minimized crosstalk.
6	TRKG Error MAX / RF LEVEL MAX Adjustment	VR605 (TE MAX) VR606 (RF MAX)	CN401-9 (TRKG ERR) CN401-3 (RF)	• Test mode #15,000 / #115 still TRKG servo close / open • TILT servo OFF	• TRK error MAX (VR605) RF MAX (VR606) • Check crosstalk
7	Tilt Sensor Inclination/ Tilt Balance Adjustment	Tilt sensor inclination adjustment screw VR607(TILT BAL.)	Video output terminal (TV monitor Test mode screen)	• Test mode #16,200 / #115 still TRKG servo loop close • TILT servo OFF	• Set VR607 to the center. • Adjust the adjustment screw so that the tilt error display code is 6, 7, or 8. • Adjust VR607 so that the tilt error display becomes 7.
8	Spindle Motor Centering Check	None	CH1:CN401-9(TRKG ERR) CH2:CN401-1, 2(TRKG A+C) (X-Y mode)	• Test mode #22,000-25,000 and #100 TRKG servo open • TILT servo ON	• Check that the amplitude of the lissajous figure of the frame #100 is the same as that of the frame #22,000-25,000.
9	Spindle Motor Centering Adjustment	Spindle motor centering adjustment screw.	CH1:CN401-9(TRKG ERR) CH2:CN401-1, 2(TRKG A+C) (X-Y mode)	• Test mode #22,000-25,000 and #100 TRKG servo open / close • TILT servo ON	• Adjust the centering adjustment screw so that the lissajous figures of #100 and #22,000-25,000 are the same.
10	Fine Grating Adjustment	Grating	CH1:CN401-9(TRKG ERR) CH2:CN401-1, 2(TRK A+C) (X-Y mode)	• Test mode #6,500 still TRKG servo open • TILT servo ON	• Minimize the Y direction of the lissajous figure. • Check TRKG balance.
11	FOCS SUM Level Adjustment	VR609	CN401-11 (FOCS SUM)	• Test mode #15,000 still TRKG servo close • Tilt servo NEUTRAL	• Adjust VR609 so that the voltage becomes 1.8V DC.
12	FOCS Servo Loop Gain Adjustment	VR604	CH1:CN401-6 (FOCS ERR) CH2:CN401-7 (FOCS IN) (X-Y mode)	• Test mode #15,000 still TRKG servo close • TILT servo NEUTRAL	• Adjust VR604 so that the lissajous figure is symmetrical with respect to the X and Y axes.
13	TRKG Servo Loop Gain Adjustment	VR603	CH1:CN401-9 (TRKG ERR) CH2:CN401-10 (TRKG IN) (X-Y mode)	• Test mode #15,000 still TRKG servo close • TILT servo NEUTRAL	• Adjust VR603 so that the lissajous figure is symmetrical with respect to the X and Y axes.
14	RF Gain Adjustment	VR601	CH1:CN401-3 (RF)	• Test mode #15,000 still TRKG servo close • TILT servo NEUTRAL	• Adjust VR601 so that the RF level becomes $300mV \pm 50mV$.
15	Coarse Centering Adjustment for Side B Play	Centering adjustment plate for side B.	CH1:CN401-9 (TRKG ERR) CH2:CN401-1, 2(TRKG A+C) (X-Y mode)	• Test mode #100 still TRKG servo open / close • TILT servo ON	• Adjust that the X-axis amplitude of the lissajous figure becomes maximum.
16	Pickup Tangential Direction Angle Adjustment for Side B Play	Pickup tangential direction angle adjustment screw.	Video output terminal (TV monotor)	• Test mode #115 still TRKG servo close • TILT servo ON	• Adjust that the crosstalk is minimized.
17	Fine Centering Adjustment for Side B Play	Centering adjustment plate for side B	CH1:CN401-9 (TRKG ERR) CH2:CN401-1, 2(TRKG A+C) (X-Y mode)	• Test mode #100 still TRKG servo open • TILT servo ON	• Adjust that the X-axis amplitude of the lissajous figure becomes maximum.

	ADJUSTMENT	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
18	Reference Frequency Adjustment	VC901	IC402 - pin 8	• Stop mode (blueback screen)	• Adjust VC901 so that the frequency becomes 3.579545MHz.
19	VCO Centering Frequency Adjustment	VR481	CH1 : C471 + side lead wire CH2 : C499 + side lead wire	• Normal mode • #5,100 still	• The center of CH1's video signal jitter is delayed by 71 μ S with CH2's video signal.
20	Output Video Level Adjustment	VR482	VIDEO OUTPUT terminal	• Normal mode • #19,900 still	• Adjust VR482 so that the voltage between the sync tip and the white peak becomes 1Vp-p $\pm$ 5%.
21	1H Delay Video Level Adjustment	VR441	CH1 : C443 lead wire CH2 : C445 lead wire	• Normal mode • #3,800 still	• The 1H delay video level becomes the same as the main line video signal.
22	VPS Video Level Adjustment	VR521	TV monitor	• Normal mode • #8,000 still	• Color irregularity on the magenta screen is minimized.

ADJUSTMENT POINTS OF THE MAIN BOARD ASSEMBLY



● MECHANICAL ADJUSTMENTS

1. TILT OFFSET ADJUSTMENT

Mechanical Adjustment

- Purpose: To adjust the tilt offset voltage to 0V.
- When not properly adjusted: Playability is poor when playing side B of the disc.
Crosstalk will be generated.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode

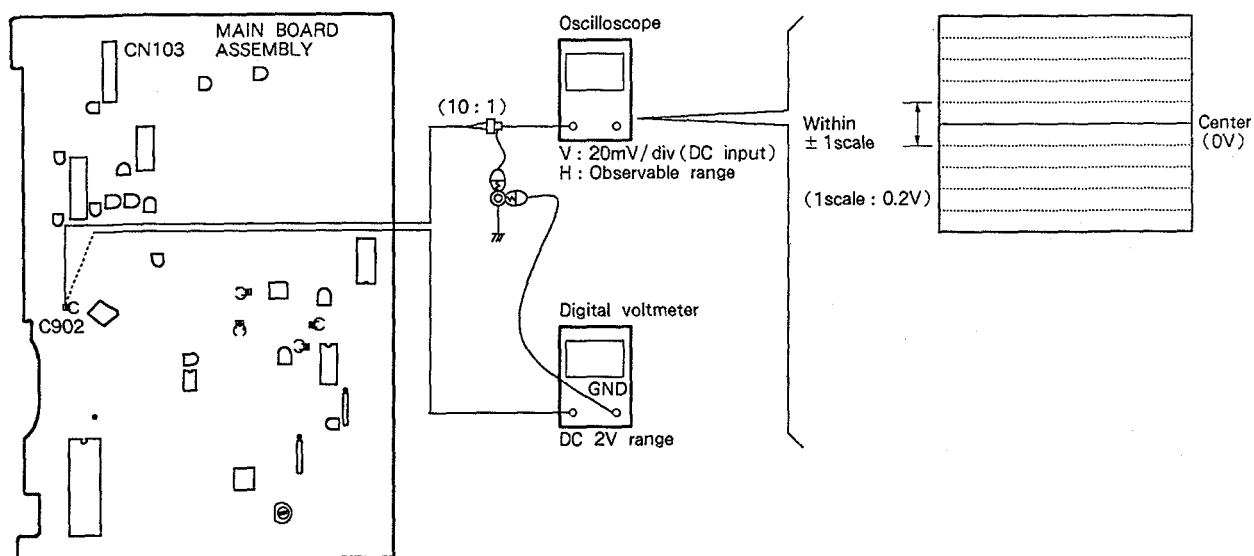
- Oscilloscope ● (Digital voltmeter)

- — (minus) lead wire of C902
- Normal mode (STOP mode)

- Positions to be adjusted

- VR610 (TILT OFFSET)

Connection diagram



Adjustment Procedure

1. Disconnect the flexible cable from CN103.
(Perform this step by turning off the power.)
2. Set the oscilloscope to no input (GND) mode and set the main scale to the center position (0V).
3. Set the oscilloscope to the DC input mode and connect to the — (minus) lead wire of C902.
4. Adjust VR610 so that the DC level which appears on the oscilloscope within $\pm$ one scale ($\pm 0.2V$) as compared with center (0V).
5. Connect the flexible cable to CN103.
(Perform this step by turning off the power.)

How to adjustment when using the Digital voltmeter

1. Disconnect the flexible cable from CN103.
(Perform this step by turning off the power.)
2. Connect the digital voltmeter to the — (minus) lead wire of C902.
3. Adjust VR610 so that the DC voltage becomes $0 \pm 0.2V$.
4. Connect the flexible cable to CN103.
(Perform this step by turning off the power.)

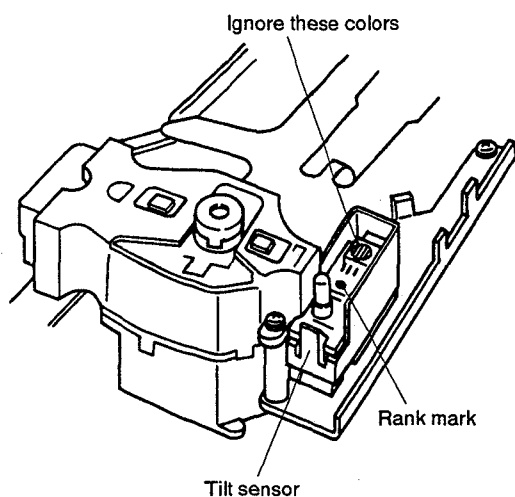
2. TILT SERVO GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: Adjustment of the tilt servo's gain according to the tilt sensor's sensitivity rank.
- When not properly adjusted: Increased tilt servo hunting and increased crosstalk.

- | | |
|--|--|
| <ul style="list-style-type: none"> ● Measuring instruments and jigs: ● Measuring point: ● Test disc and player mode | <ul style="list-style-type: none"> ● Small screwdriver |
| <ul style="list-style-type: none"> ● Positions to be adjusted | <ul style="list-style-type: none"> ● Power OFF ● VR608 |

Connection diagram



Adjustment Procedure

1. Use a screwdriver to adjust the angle of VR608 according to the rank indicator's color.

Rank	Color	VR Angle
A	Red	Clockwise all the way
B	Clear	Mechanical center
C	Blue	Counterclockwise all the way

3. COARSE GRATING AND TRACKING (TRKG) BALANCE ADJUSTMENT

Mechanical Adjustment

- **Purpose:** To adjust the laser beam which is divided into three by the grating to the optimum position on the track. Set the TRKG servo offset voltage to 0 V.
- **When not properly adjusted:** Disc playback will be impossible. During play, tracks may be skipped.

- **Measuring instruments and jigs:**

- **Measuring point:**

- **Test disc and player mode**

- **Positions to be adjusted**

- **Small screwdriver** ● **Oscilloscope**

- **CN401 -9 (TRKG ERR)**

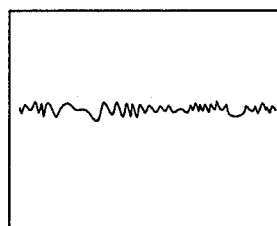
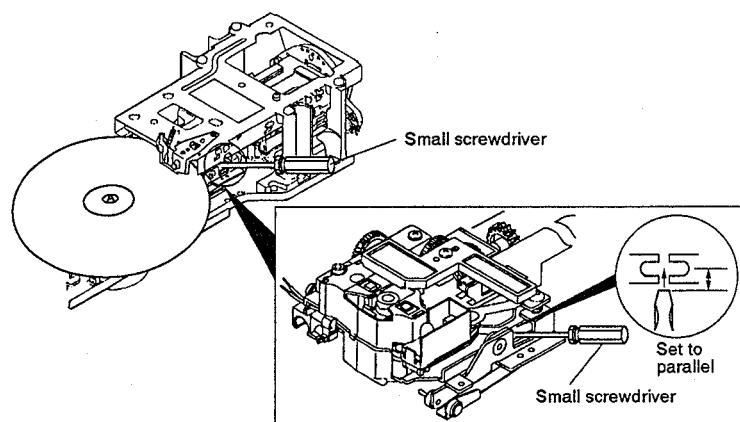
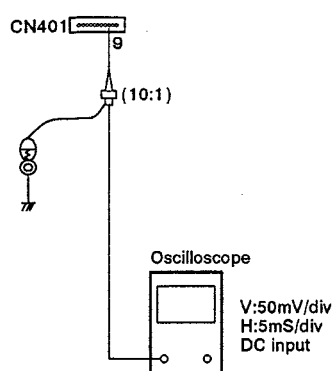
- **8 - inch LD test disc GGV1003**

- **Test Mode (#6,500, TRKG servo : Open, Tilt servo : Neutral)**

- **The carriage assembly should be in the forward state.**

- **Grating** ● **VR602 (TRKG BAL)**

Connection diagram



Not null point

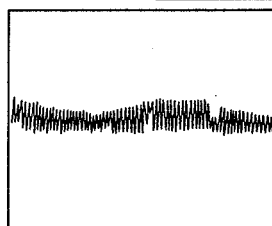


Fig. 2 Null point

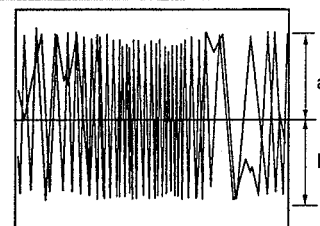


Fig. 3 Maximize the TRKG error
a=b

Adjustment Procedure

<Coarse Grating Adjustment>

1. Play the LD test disc.
2. Search around for frame #6,500.
3. Open the TRKG servo.
(See the table of operation in the test mode.)
4. Connect an oscilloscope to CN401-9 and observe the waveform.
5. Coarse adjust the TRKG error waveform becomes maximum by turning the TRKG and tangential direction angle adjustment screw for the pickup adjustment. (This is indispensable in order to minimize dispersion in the subsequent adjustments.)
6. Insert the small screwdriver into the grating adjustment hole. Turning the grating will allow you to vary the amplitude of the TRKG error waveform. Find the position where the waveform amplitude becomes minimum with a smooth envelope. (Fig. 2) (This indicates that the 3-way split laser beams are directed onto the track. This is called the null point.)

7. Slowly turn the grating counterclockwise from the on track position until the waveform amplitude becomes maximum. (Fig. 3)

8. Close the TRKG servo and check that a normal picture is displayed on the TV screen.

<TRKG Balance Adjustment>

1. Align the oscilloscope GND so that it comes to the center of the oscilloscope screen.
2. Adjust VR602 so that the positive and negative amplitude of the TRKG error waveform become equal. (Fig. 3)

Note: If adjustment of VR602 fails to disturb the tracking, perform the adjustment after set VR607 to the mechanical center.

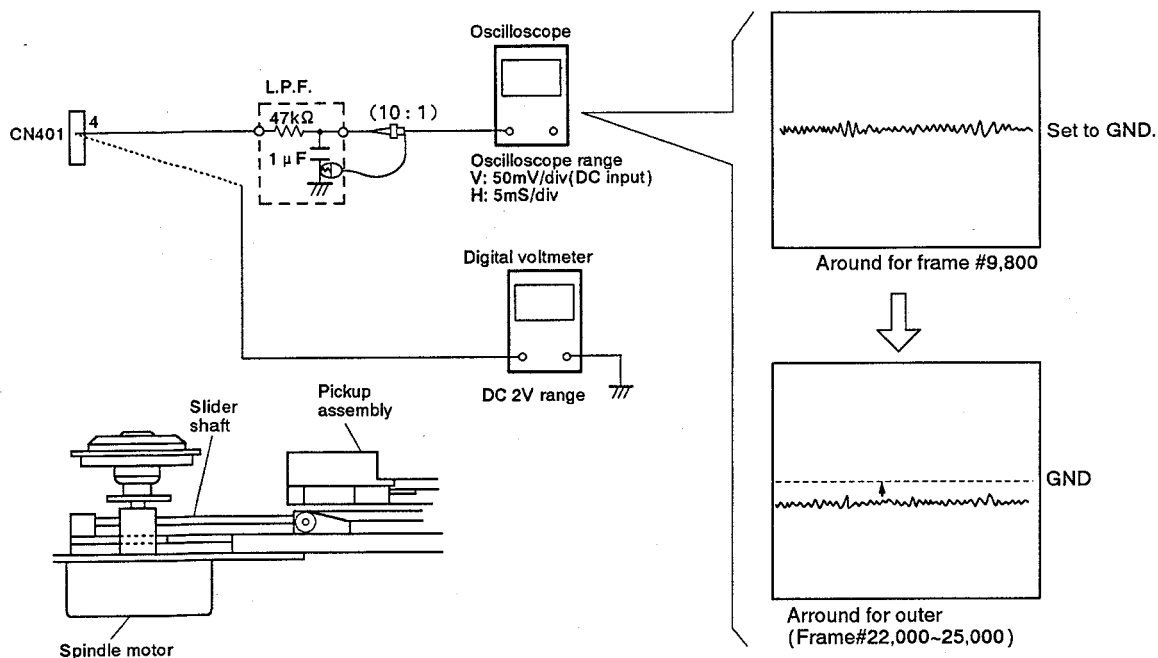
4. SLDR SHAFT HORIZONTAL ADJUSTMENT

Mechanical Adjustment

- Purpose: Setting the slider shaft horizontally to enable the pickup to move in parallel with the disc.
- When not properly adjusted: With a warped disc, the FOCS servo does not function at the inner or outer periphery.
All following adjustments can be done correctly.

- | | |
|--|--|
| <ul style="list-style-type: none"> ● Measuring instruments and jigs: ● Measuring point: ● Test disc and player mode ● Positions to be adjusted | <ul style="list-style-type: none"> ● Oscilloscope ● Low-pass filter ($47k\Omega + 1\mu F$) ● (Digital voltmeter) ● CN401 - 4 (FOCS RTN) and GND. ● 8-inch LD test disc GGV1003 ● Test Mode (#9,800 / #22,000 - 25,000, TRKG servo : Open, Tilt servo : OFF) ● Player SKIP ($\leftarrow$ or $\rightarrow$) key (During test mode) |
|--|--|

Connection diagram



Adjustment Procedure

1. Connect a digital voltmeter to CN401 - 4 via L. P. F.
2. Open the TRKG servo, and search around for frame #9,800.
3. Check the voltage.
3. Search around for frame #22,000 - 25,000 and check that the voltage is same as the frame #9,800. If not, adjust the SKIP key so that the voltage is same as the frame #9,800.

5. PICKUP INCLINATION ADJUSTMENT

Mechanical Adjustment

● Purpose: Adjustment of the pickup inclination to direct the laser beam vertically with respect to the disc.

● When not properly adjusted: Crosstalk will be generated.

● Measuring instruments and jigs:

● Measuring point:

● Test disc and player mode

● Positions to be adjusted

● TV monitor ● Phillips screwdriver ● Oscilloscope

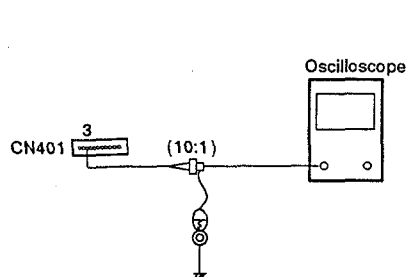
● CN401 - 3(RF) ● Player's VIDEO OUT terminal

● 8-inch LD test disc GGV1003

● Test Mode [#2,701 (Black, 7.5%) still , TRKG servo : close, Tilt servo : OFF]

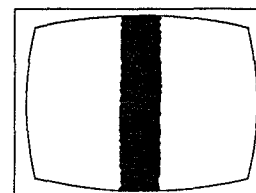
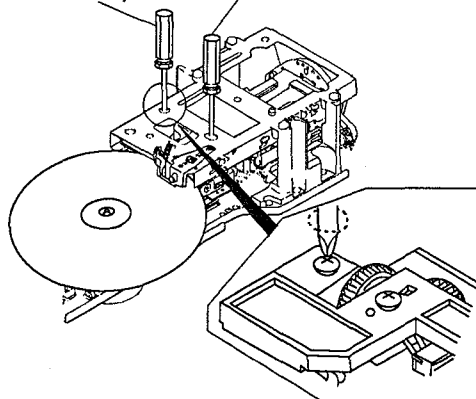
● Pickup assembly TRKG / Tangential direction inclination adjustment screws

Connection diagram



TRKG direction inclination adjustment

Tangential direction inclination adjustment



Minimum crosstalk on the screen

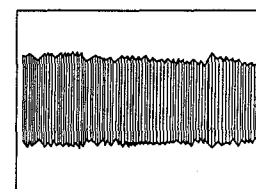


Fig. 1 RF waveform

Adjustment Procedure

1. Connect the oscilloscope to CN401 - 3.
2. Search for frame #2,701 and observe the RF waveform.(Fig. 1)
3. Adjust the pickup's TRKG/Tangential direction inclination adjustment screw to maximize the waveform's amplitude.
4. Look at the TV screen and make sure there is no crosstalk.

Note : Perform "6. TRKG Error MAX./RF Level MAX. Adjustment" even when the crosstalk is not conspicuous on the TV screen.

(For improvement of the playability of CDs.)

6. TRKG ERROR MAX./ RF LEVEL MAX. ADJUSTMENT

Mechanical Adjustment

- Purpose: To set the FOCS servo to the optimum state when playing the normal playback and track jump (search).
- When not properly adjusted: Crosstalk will be generated.

- Measuring instruments and jigs:

- Measuring point:
- Test disc and player mode

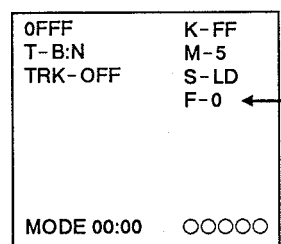
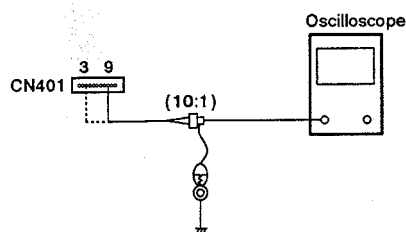
- Positions to be adjusted

- TV monitor ● Oscilloscope

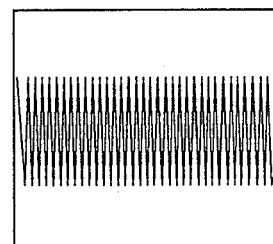
- CN401 -3 (RF) ● CN401 -9 (TRKG ERR) ● Player's VIDEO OUT terminal
- 8-inch LD test disc (GGV1003)
- Test Mode [#2,701 (Black, 7.5%) / #115 (H.V Bar) still, TRKG servo : Close / Open, Tilt servo : OFF]

- VR605 (TE MAX.) ● VR606 (RF MAX.)

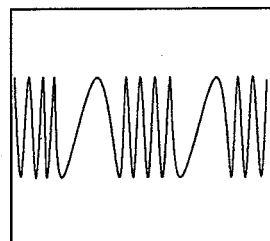
Connection diagram



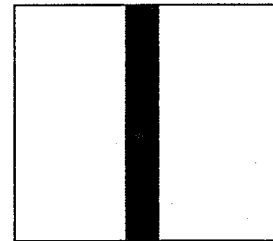
Screen display of test mode



Set to maximum RF amplitude at frame #2,701.



Maximize the TRKG error.



#115 crosstalk minimum

Adjustment Procedure

1. Connect the oscilloscope to CN401-9.
2. Play the LD test disc and open the TRKG servo.
3. Confirm that the test mode screen display is F-0.
If not, press the MULTI-SPEED REV button to F-0.
4. Adjust VR605 so that the amplitude of the TRKG error waveform becomes maximum.
5. Close the TRKG servo.
6. Connect the oscilloscope to CN401-3.
7. Press the MULTI-SPEED FWD button to display "F-1" on the TV screen.
8. Search around for frame #15,000 and adjust VR606 so that the amplitude of the RF waveform becomes maximum.
9. Confirm that the crosstalk on the TV screen becomes minimum at frame #115.

Note : Perform "RF Level MAX. Adjustment" and "5. Pickup Inclination Adjustment" once or twice repeatedly to the optimum state.

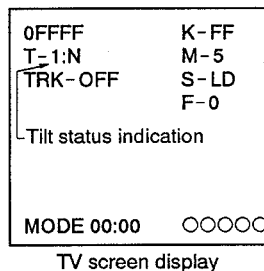
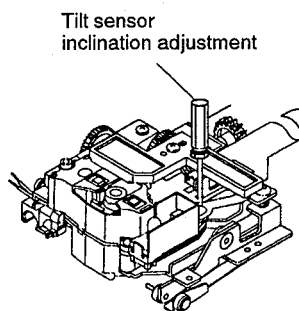
7. TILT SENSOR INCLINATION / TILT BALANCE ADJUSTMENT

Mechanical Adjustment

- **Purpose:** Adjustment of the tilt sensor's inclination to direct the tilt sensor's LED vertically with respect to the disc.
Also, compensation for the sensitivity difference between the two sensors.
- **When not properly adjusted:** Crosstalk will be generated.

- | | |
|--|---|
| <ul style="list-style-type: none"> ● Measuring instruments and jigs: ● Measuring point: ● Test disc and player mode ● Positions to be adjusted | <ul style="list-style-type: none"> ● TV monitor ● Small Phillips screwdriver ● Player's VIDEO OUT terminal ● 8-inch LD test disc (GGV1003) ● Test Mode (#16,200 and #115 still, TRKG servo : close, Tilt servo : OFF) ● Tilt sensor inclination adjustment screw ● VR607 (TILT BAL). |
|--|---|

Connection diagram



Note: This display indicates the tilt error display's location. Other displays may differ slightly from the actual.

Adjustment Procedure

1. Search for frame #16,200 on the test disc.
2. Set VR607 to the mechanical center.
3. Adjust the tilt sensor inclination adjustment screw so that the tilt status display code is 6, 7, or 8 on the TV monitor.
Note : When adjusting, turn the tilt-sensor inclination adjustment screw clockwise from the best point an extra quarter of a turn. Then turn the screw back to a quarter of a turn.
4. Search for frame #115.
5. Adjust VR607 so that the tilt error display becomes 7.

8. SPINDLE MOTOR CENTERING CHECK

Mechanical Adjustment

- Purpose: To check that the center of the spindle motor is on the orbit of the laser beam.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode

- Oscilloscope ● Resistor($10k\Omega \times 2$)
- CN401-9 (TRKG ERR), CN401-1 (TRKG C) and CN401-2 (TRKG A)
- 8-inch LD test disc GGV1003 ● CD test disc (YEDS-7)
- Test mode (#22,000-#25,000 and #100 still, TRKG servo : Open, Tilt servo : ON)
- The carriage assembly should be in the forward state.
- Check the Lissajous figure

Connection diagram

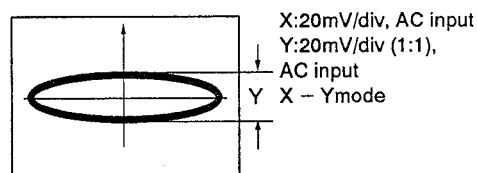
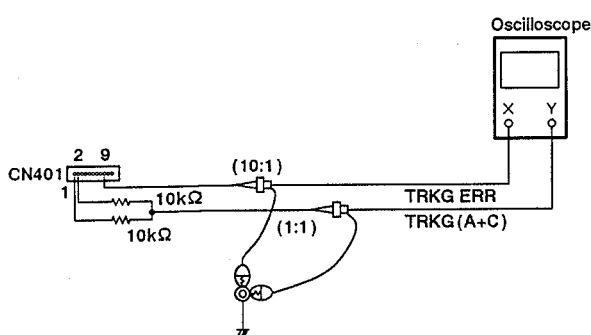


Fig. 1 Lissajous figure of the inner track of the disc (CD)

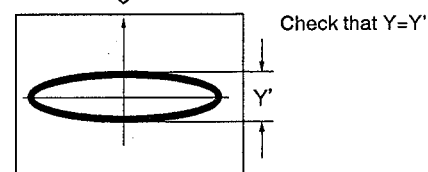


Fig. 2 Lissajous figure of the outer track of the disc (CD)

Checking Procedure

1. Play the 8-inch LD test disc.
2. Move the pickup to frame #22,000 - 25,000 by scanning or searching, then open the TRKG servo.
3. Connect the X-input (CH-1) of the oscilloscope to CN401-9 and the Y-input (CH-2) to CN401-1 and 2 via the $10k\Omega$ resistor.
Set the oscilloscope to the X-Y mode and observe the Lissajous figures of the TRKG error signal and the TRKG (A+C) signal.
4. Write down the Y-axis amplitudes of the Lissajous figures. (Fig. 1)
5. Close the TRKG servo and search frame #100, then open the TRKG servo again to observe the Lissajous figure.
At this time, check that the Y-axis amplitude of the Lissajous figure is the same as that noted in step 4. (Fig. 2)

6. Remove the 8-inch LD test disc from the player, then load the CD test disc and repeat the checking procedures steps 1 to 5. However, it is not necessary to specify the inner or outer track positions of the disc. If the Y-axis amplitude of the Lissajous figure is different for the inner and outer tracks, perform "9. Spindle Motor Centering Adjustment".

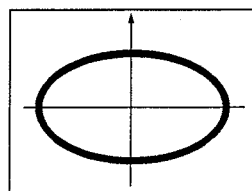


Fig. 3 Lissajous figure when not properly adjusted

9. SPINDLE MOTOR CENTERING ADJUSTMENT

Mechanical Adjustment

- Purpose: To adjust so that the center of the spindle motor is on the orbit of the laser beam.
- When not properly adjusted: Track skips, or searching takes too long.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Small phillips screwdriver
- Oscilloscope
- Resistor($10k\Omega \times 2$)
- CN401 - 9 (TRKG ERR), CN401 - 1 (TRKG C) and CN401 - 2 (TRKG A)
- 8 - inch LD test disc GGV1003
- CD test disc (YEDS - 7)
- Test Mode (#22,000 - #25,000 and #100 still, TRKG servo : Open/Close, Tilt servo : ON)
- The carriage assembly should be in the forward state.
- Spindle motor centering adjustment screw

Connection diagram

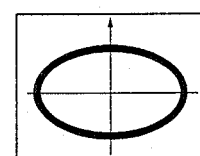
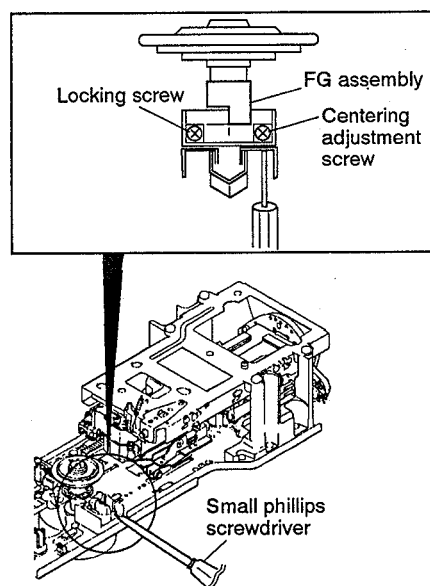
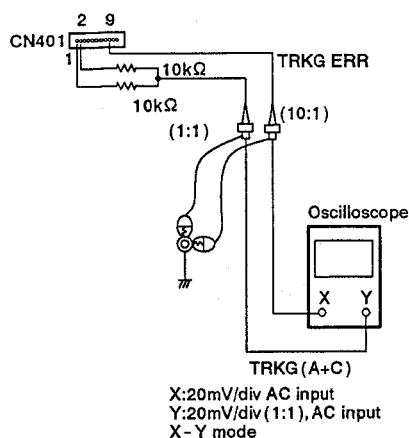


Fig. 1

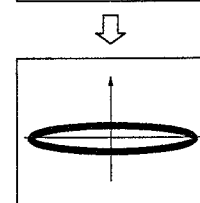


Fig. 2

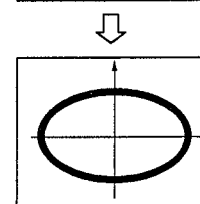


Fig. 3

Lissajous figure.

Adjustment Procedure

1. Connect the X-input (CH-1) of the oscilloscope to CN401 - 9 and the Y-input (CH-2) to CN120 - 1 and 2 via the $10k\Omega$ resistor.
2. Play the 8-inch LD test disc and search frame #22,000 - #25,000.
3. Open the TRKG servo and observe the Lissajous figures of the TRKG error signal and the TRKG sum signal.
4. Fine-adjust the grating so that the Y-axis amplitude of the Lissajous figure is minimized. (Fig. 2)
5. Close the TRKG servo and search frame #100.
6. Open the TRKG servo again and observe the Lissajous figure and write the values down. (Fig. 1)
7. Loosen a locking screw and insert the small phillips head screwdriver from the adjusting hole, and turn the centering adjustment screw slowly so that the Y-axis amplitude of the Lissajous figure is reduced. After the Y-axis amplitude of the Lissajous figure is minimized, turn the adjusting screw further until the amplitude becomes the same shape as that observed in step 6. (Fig. 1-3)
8. Close the TRKG servo, and move the pickup assembly to the outer track of the disc (#22,000 - #25,000), then perform the adjustments in steps 4 to 7 again.
9. Re-open the TRKG servo and observe the Lissajous figure to check that the Y-axis amplitude is minimum. (Fig. 2)
If the Y-axis amplitude of the Lissajous figure is larger than specified, repeat the adjustment procedures from steps 5 to 8.
10. After adjustment is complete, perform the adjustment in "8. Spindle Motor Centering Check" item 6.
11. Tighten the locking screw.

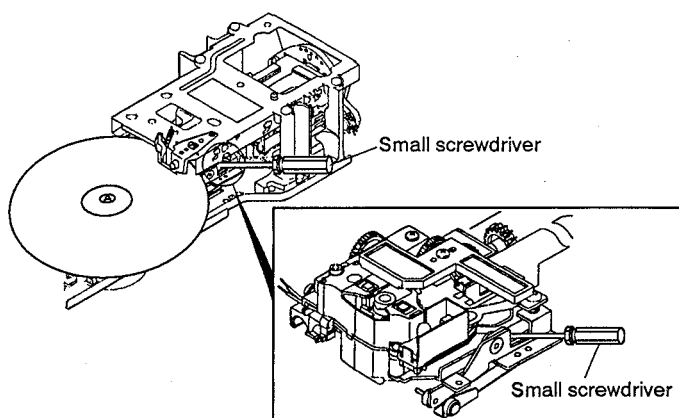
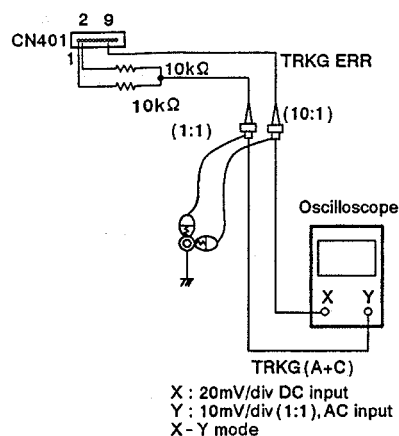
10. FINE GRATING ADJUSTMENT

Mechanical Adjustment

- **Purpose:** To fine adjust the grating so that the two tracking beams for the TRKG servo are projected in the optimum positions on the tracks being played. Set the TRKG servo loop offset voltage to 0V.
- **When not properly adjusted:** During play, tracks may be skipped.

- | | |
|--|---|
| <ul style="list-style-type: none"> ● Measuring instruments and jigs: ● Measuring point: ● Test disc and player mode ● Positions to be adjusted | <ul style="list-style-type: none"> ● Oscilloscope ● Small screwdriver ● Resistor(10kΩ $\times$ 2) ● CN401 -9 (TRKG ERR), CN401 -1 (TRKG C) and CN401 -2 (TRKG A) ● 8 -inch LD test disc GGV1003 ● Test Mode (#6,500 still, TRKG servo : Open, Tilt servo : ON) ● The carriage assembly should be in the forward state. ● Grating |
|--|---|

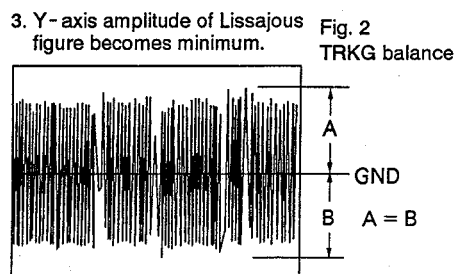
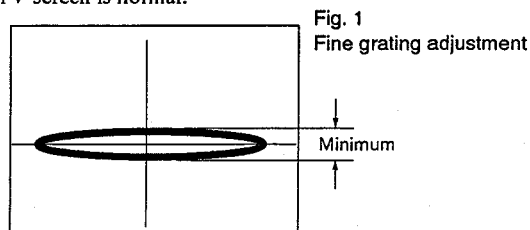
Connection diagram



Adjustment Procedure

1. Connect the X-input (CH-1) of the oscilloscope to CN401 -9 and the Y-input (CH2) to CN401 -1 and 2 via the 10k Ω resistor.
2. Play the LD test disc and search frame #6,500, then open the TRKG servo.
Set the oscilloscope to the X-Y mode and observe the Lissajous figures of the TRKG error signal and the TRKG sum signal.
3. Insert the small screwdriver into the grating adjustment hole, and fine-adjust the grating so that the Y-axis amplitude of the Lissajous figures is minimized. (Fig. 1)
If the grating is turned too much and the optimum position can no longer be found, repeat the "3. Coarse Grating Adjustment".
4. Select the oscilloscope's X-input (CH-1) and check that the positive and negative amplitudes of the TRKG error signal are equal. (Fig. 2)
If they are not, repeat the "3. Tracking Balance Adjustment".

5. Close the TRKG servo and check that the picture (image) on the TV screen is normal.

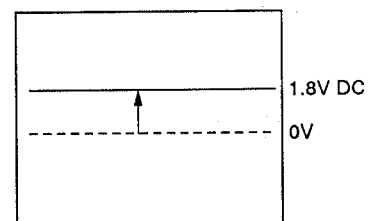
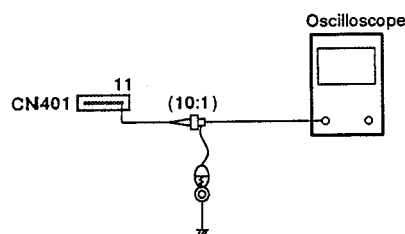


11. FOCS SUM LEVEL ADJUSTMENT**Mechanical Adjustment**

- **Purpose:** To set the sum level (FOCS A+B) of B1 – B4 to the optimum value for activating the FOCS servo.
- **When not properly adjusted:** Playability is poor.

- **Measuring instruments and jigs:**
- **Measuring point:**
- **Test disc and player mode**
- **Positions to be adjusted**

- **Oscilloscope**
- CN401- 11 (FOCS SUM)
- 8 - inch LD test disc GGV1003
- Test mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)
- VR609 (FOCS SUM LEVEL)

Connection diagram**Adjustment Procedure**

1. Connect the oscilloscope to CN401 - 11.
2. Adjust VR609 so that the voltage becomes 1.8V DC.

12. FOCUS SERVO LOOP GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: To set the loop gain of the FOCS servo to the optimum value.
- When not properly adjusted: Playability is poor.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● AF oscillator ● Resistor($47k\Omega$)
- CN401 -6(FOCS ERR) and CN401 -7(FOCS IN)
- 8-inch LD test disc GGV1003
- Test mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)
- The carriage assembly should be in the forward state.
- VR604 (FOCS GAIN)

Connection diagram

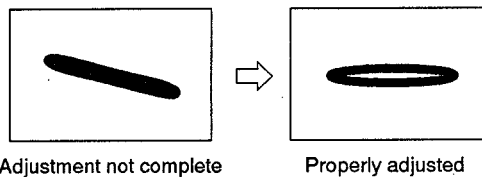
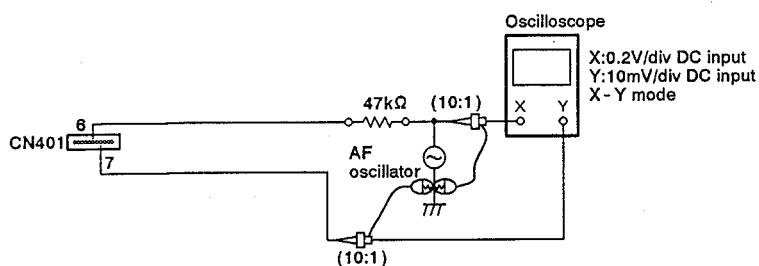


Fig. 1

Adjustment Procedure

1. Connect the oscilloscope's X-input (CH-1) via the $47k\Omega$ resistor and AF oscillator to CN401 -6, and the Y-input (CH-2) to CN401 -7, as shown in the above diagram.
2. Play the 8-inch LD test disc and search frame #15,000.
3. Set the AF oscillator output to 1.7kHz/6Vp-p.
4. Set the oscilloscope to the X-Y mode and observe the Lissajous figure.
5. Adjust VR604 so that the Lissajous figure is symmetrical on both the X-axis and Y-axis of the oscilloscope. (Fig. 1)

Note : If the AF oscillator output does not exceed 6Vp-p, reduce the value of the resistor ($47k\Omega$) in the above diagram, for easier observation of the Lissajous figure. (not below $33k\Omega$)

13. TRKG SERVO LOOP GAIN ADJUSTMENT

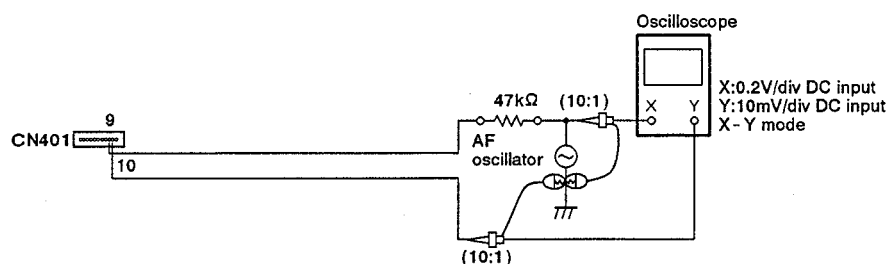
Mechanical Adjustment

- Purpose: To set the loop gain of the TRKG servo to the optimum value.
- When not properly adjusted: Playability is poor.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● Resistor(47k Ω) ● AF oscillator
- CN401 - 9 (TRKG ERR), CN401 - 10 (TRKG IN)
- 8-inch LD test disc GGV1003
- Test mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)
- The carriage assembly should be in the forward state.
- VR603 (TRKG GAIN)

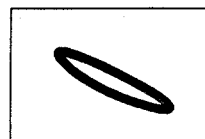
Connection diagram



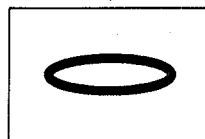
Adjustment Procedure

1. Connect the oscilloscope's X-input(CH-1) via the 47k Ω resistor and AF oscillator to CN401 - 9, and the Y-input (CH-2) to CN401 - 10, as shown in the above diagram.
2. Play the LD test disc and search frame #15,000.
3. Set the AF oscillator output to 3.0kHz/6Vp-p.
4. Set the oscilloscope to the X-Y mode and observe the Lissajous figure.
5. Adjust VR603 so that the Lissajous figure is symmetrical on both the X-axis and Y-axis of the oscilloscope. (Fig. 1)

Note : If the AF oscillator output does not exceed 6Vp-p, reduce the value of the resistor (47k Ω) in the above diagram, for easier observation of the Lissajous figure. (not below 33k Ω)



Adjustment not complete



Properly adjusted

5. The X-axis and Y-axis of the Lissajous figure are symmetrical.

Fig. 1

14. RF GAIN ADJUSTMENT

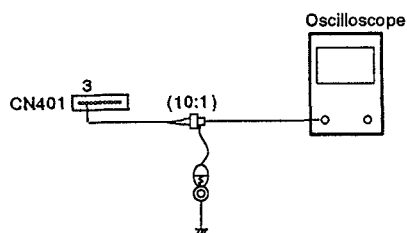
Mechanical Adjustment

- Purpose: To adjust the RF signal amplitude to the optimum value.
- When not properly adjusted: Dropout occurs frequently.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope
- CN401 -3(RF signal)
- 8 - inch LD test disc GGV1003
- Test Mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)
- The carriage assembly should be in the forward state.
- VR601 (RF LEVEL)

Connection diagram



Adjustment Procedure

1. Play the LD test disc and search frame #15,000.
2. Connect an oscilloscope to CN401-3(RF signal) and observe the RF signal.
3. Adjust VR601 so that the amplitude of the RF signal becomes $300\text{mV} \pm 50\text{mV}$. (Fig. 1)

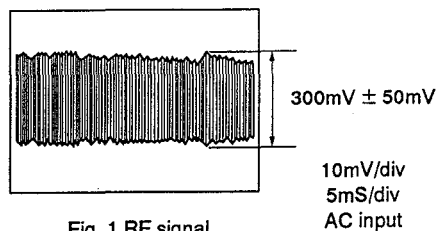


Fig. 1 RF signal

15. COARSE CENTERING ADJUSTMENT FOR SIDE B PLAY

Mechanical Adjustment

- **Purpose:** To check that the position check at the start play and to set the center of the spindle motor on the path of the laser beam when playing the side B of the disc.
- **When not properly adjusted:** Tracks skipped, longer searching time or searching is impossible when playing side B of the disc.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- L-shaped eccentric screwdriver (GGV-129)
- Oscilloscope
- Resistor ($10k\Omega \times 2$)
- CN401 - 9 (TRKG ERR), CN401 - 1 (TRKG C) and CN401 - 2 (TRKG A)
- 8-inch LD test disc GGV1003
- The carriage assembly should be in the reverse state.
- Test mode (#100 still, TRKG servo : Open /Close, Tilt servo : ON)
- Centering adjustment plate for side B

Connection diagram

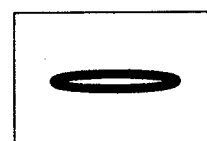
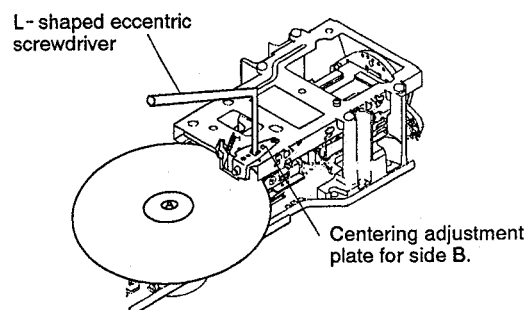
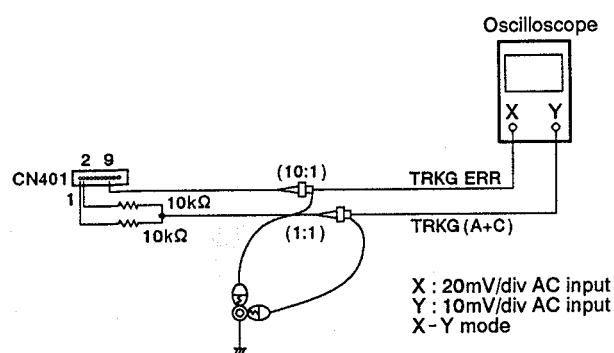


Fig. 1

Properly adjusted (X:maximum).

Adjustment Procedure

1. Turn the LD test disc upside-down (change from side A to side B). The start play position from side A to B should be within frame #3,500.
2. Set the oscilloscope to the X-Y mode, and connect the oscilloscope's X-input (CH-1) to CN401 - 9 (TRKG ERR) and the Y-input (CH-2) to CN401 - 1 and 2 (TRKG A+C) via the $10k\Omega$ resistor.
3. Play the LD test disc and search frame #100, then open the tracking servo.

Note: If the center is too eccentric on side B of the disc, since searching will be impossible on side B, open the TRKG servo when the carriage assembly moves to the side B play position and searches around frame #100.

4. While observing the Lissajous figure on the oscilloscope, insert the eccentric screwdriver into the centering adjustment plate for side B and adjust it so that the X-axis amplitude of the Lissajous figure is minimized (on-track position). Then turn the eccentric screwdriver clockwise further until the X-axis amplitude of the Lissajous figure becomes maximum. (Fig. 1)

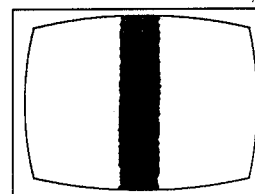
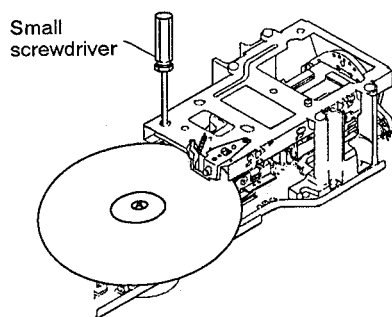
Note: When "5. Pickup inclination Adjustment" is performed with the pickup in the forward state, perform "16. Pickup Tangential Direction Angle Adjustment for Side B Play" and "17. Fine Centering Adjustment for Side B play".

16. PICKUP TANGENTIAL DIRECTION ANGLE ADJUSTMENT FOR SIDE B PLAY Mechanical Adjustment

- Purpose: To adjust the crosstalk to become minimum in the tangential direction angle of the pickup assembly when playing side B of the disc.
- When not properly adjusted: Crosstalk is significant.

- | | |
|--|--|
| <ul style="list-style-type: none"> ● Measuring instruments and jigs: ● Measuring point: ● Test disc and player mode ● Positions to be adjusted | <ul style="list-style-type: none"> ● TV monitor ● Small phillips screwdriver ● Player's VIDEO OUT terminal (Monitor screen) ● 8 - inch LD test disc GGV1003 ● Test mode (#115 (H.V Bar) still, TRKG servo : Close, Tilt servo : ON) ● The carriage assembly should be in the reverse state. ● Pickup tangential direction angle adjustment screw |
|--|--|

Connection diagram



Minimum crosstalk

Adjustment Procedure

1. Play the LD test disc and search frame #115.
2. Check if crosstalk appears on the screen of the TV monitor, and adjust the pickup tangential direction angle adjustment screw so that the crosstalk is minimized.
3. After steps 1 and 2 have been completed, perform "15. Coarse Centering Adjustment for Side B Play" again.

Note: When the pickup tangential direction angle for side B play is varied by this adjustment, the center of the disc for side B may be shifted slightly. As a countermeasure, perform the centering adjustment again.

17. FINE CENTERING ADJUSTMENT FOR SIDE B PLAY

Mechanical Adjustment

- Purpose: To set the center of the spindle motor on the track of the laser beam when playing the side B of the disc.
- When not properly adjusted: Tracks skipped when playing side B of the disc.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● L-Shaped eccentric screwdriver (GGV - 129) ● Resistor ($10k\Omega \times 2$)
- CN401 - 9 (TRKG ERR), CN401 - 1 (TRKG C) and CN401 - 2 (TRKG A)
- 8-inch LD test disc GGV1003
- Test mode (#100 still, TRKG servo : Open, Tilt servo : ON)
- The carriage assembly should be in the reverse state.
- Centering adjustment plate for side B

Connection diagram

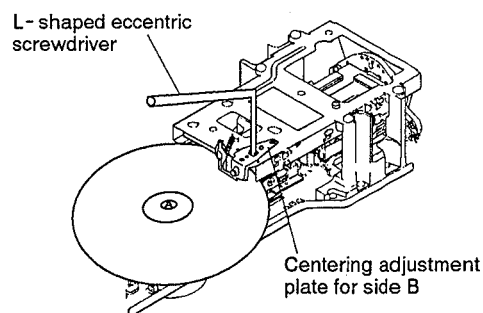
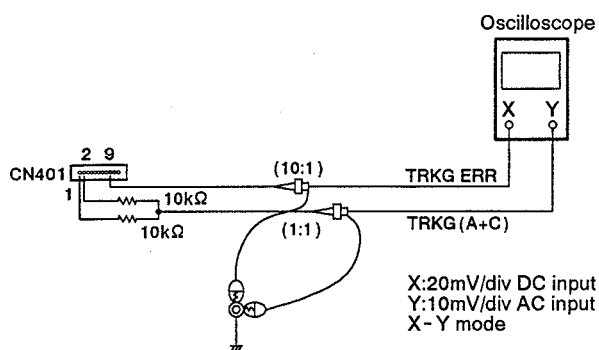


Fig. 1

X - axis of Lissajous figure maximum.

Adjustment Procedure

1. Set the oscilloscope to the X-Y mode, and connect the oscilloscope's X-input (CH-1) to CN401 - 9 (TRKG ERR) and the Y-input (CH-2) to CN401 - 1 and 2 (TRKG A+C) via the $10k\Omega$ resistor.
2. Play the LD test disc and search frame #100.
3. Open the TRKG servo.
4. While observing the Lissajous figure on the oscilloscope, insert the eccentric screwdriver into the centering adjustment plate for side B and adjust it so that the X-axis amplitude of the Lissajous figure becomes maximum. (Fig. 1)
5. Turn the power OFF.
6. Fixing and locking the screws as follows;
 - Spindle motor centering adjustment screw
 - Pickup tangential direction angle adjustment screw
 - Centering adjustment hole for side B
 - Tilt sensor inclination adjustment screw

● ELECTRICAL ADJUSTMENT

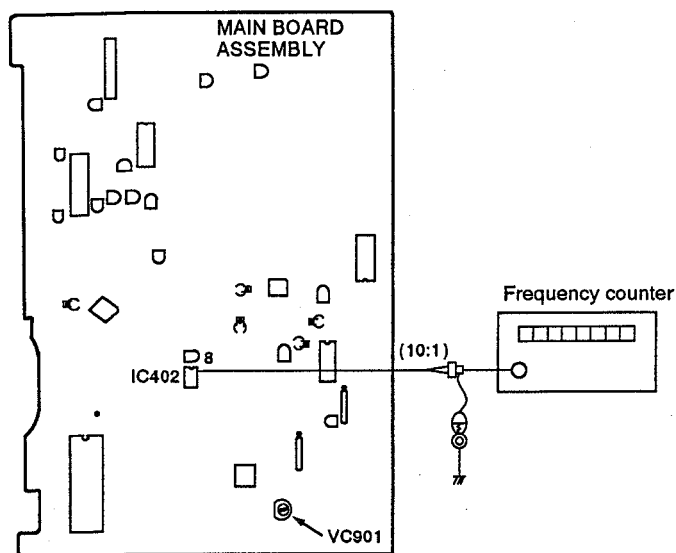
18. REFERENCE FREQUENCY ADJUSTMENT

Electrical Adjustment

- Purpose: Adjustment of the standard clock frequency.
- When not properly adjusted: Incorrect color tint. No TV color lock. VCXO cannot be adjusted during LDD playback.

- | | |
|--|--|
| <ul style="list-style-type: none"> ● Measuring instruments and jigs: ● Measuring point: ● Test disc and player mode ● Positions to be adjusted | <ul style="list-style-type: none"> ● Frequency counter ● Oscilloscope 10:1 probe ● IC402-8 ● Stop mode (blueback screen) ● VC901 (REF FREQ) |
|--|--|

Connection diagram



Adjustment Procedure

1. Adjust VC901 so that the frequency of the IC402-8 becomes 3.579545MHz in the stop mode. (blueback screen)

Note : The frequency counter probe should be an oscilloscope 10 : 1 probe.

19. VCO CENTERING FREQUENCY ADJUSTMENT

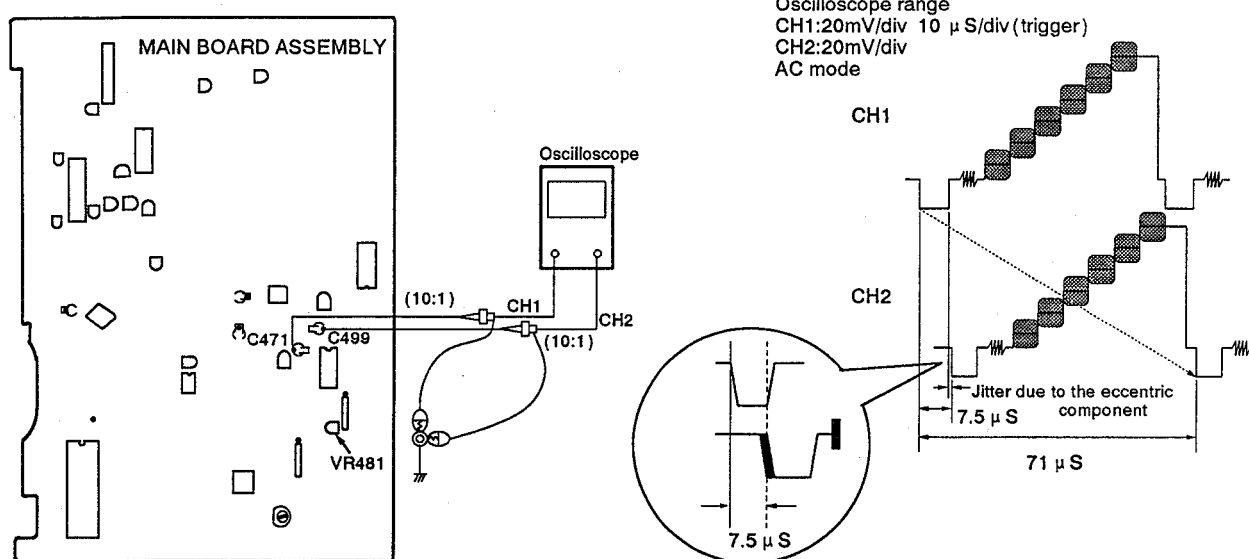
Electrical Adjustment

- **Purpose:** Setting the optimum delay time for the time axis error copensation CCD.
- **When not properly adjusted:** It is difficult to color lock, there is color lock delay after a search, and there is flicker on the white screen.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope
- CH 1 : + side lead wire of C471. ● CH 2 : + side lead wire of C499.
- 8 - inch LD test disc (GGV1003)
- Normal mode (Still mode, #5,100)
- VR481 (VCO FREQ)

Connection diagram



Adjustment Procedure

1. Connect the + side lead wire of C471 and the + side lead wire of C499 to CH 1 and CH 2 of the oscilloscope respectively.
CH 1 : Video signal before time axis error compensation.
CH 2 : Video signal after time axis error compensation.
2. Search for frame #5,100 (stair step) on the test disc. Adjust VR481 so that the center of CH2's video signal jitter is delayed by $71 \mu s$ ($1H + 7.5 \mu s$) with respect to the CH1's video signal.

Note : Do not confuse CH 1 and CH 2.

20. OUTPUT VIDEO LEVEL ADJUSTMENT

Electrical Adjustment

- Purpose: Setting the video signal level to 1.0Vp-p (75 Ω termination).
- When not properly adjusted: The screen is too bright or too dark.

- Measuring instruments and jigs:

- Measuring point:
- Test disc and player mode

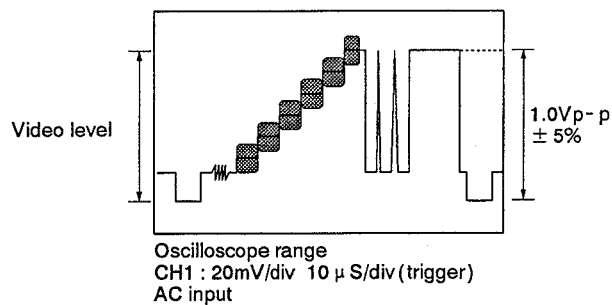
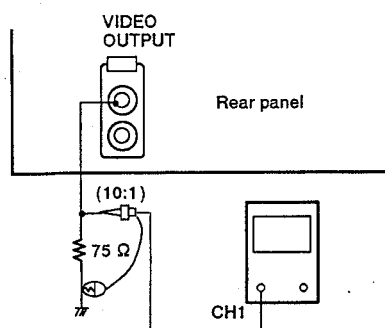
- Positions to be adjusted

- Oscilloscope
- Resistor (75 Ω)

- Player's VIDEO OUT terminal
- 8-inch LD test disc (GGV1003)
- Normal mode (Still mode, #19,900)

- VR482 (VIDEO LEVEL)

Connection diagram



Adjustment Procedure

1. Search for frame #19,900 on the test disc.
2. Connect the CH1 of oscilloscope to VIDEO OUTPUT terminal, it is to have 75 Ω termination.
3. Adjust VR482 so that the white level becomes 1.0Vp-p $\pm$ 5% from the video signal's sync tip level.

21. 1H DELAY VIDEO LEVEL ADJUSTMENT

Electrical Adjustment

- **Purpose:** Equalization of the video levels of the 1H delay video signal and the main line video signal.
- **When not properly adjusted:** If the 1H delay video signal level is high, white dropout will be noticeable and there will be H shifting. (Horizontal stripes across the screen.)

● Measuring instruments and jigs:

● Measuring point:

● Test disc and player mode

● Positions to be adjusted

● Oscilloscope

● CH 1 : lead wire of C443 ● CH 2 : lead wire of C445

● 8-inch LD test disc (GGV1003)

● Normal mode (Still mode, #3,800)

● VR441 (1H LEVEL)

Connection diagram

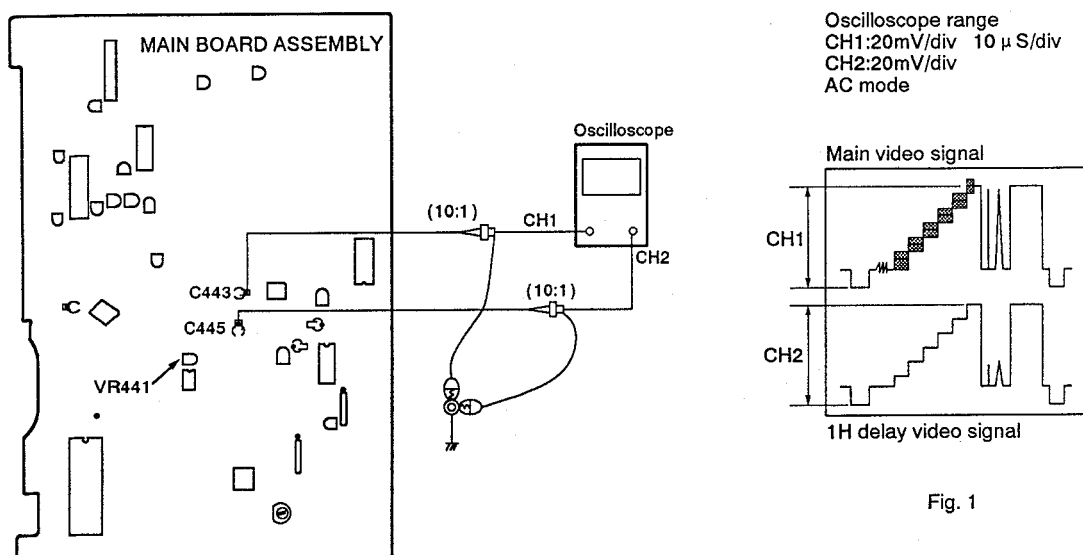


Fig. 1

Adjustment Procedure

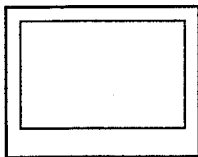
1. Search for frame #3,800 on the test disc.
2. Connect lead wire of C443 to the oscilloscope's CH 1 and lead wire of C445 to the CH 2.
3. Adjust VR441 so that the 1H delay video level (CH 2) becomes the same as the main line video level (CH 1). (See Fig. 1)

Note : The video level is the level between the SYNC tip and the white peak.

22. VPS ERROR LEVEL ADJUSTMENT**Electrical Adjustment**

- Purpose: Optimization of the color tint compensation section's error signal level.
- When not properly adjusted: There is substantial color irregularity. (especially for CDV.)

- | | |
|--|---|
| <ul style="list-style-type: none"> ● Measuring instruments and jigs: ● Measuring point: ● Test disc and player mode | <ul style="list-style-type: none"> ● TV monitor ● Player's VIDEO OUT terminal (Monitor screen) ● 8-inch LD test disc (GGV1003) ● Normal mode [Still mode, #8,000 (Magenta)] |
| <ul style="list-style-type: none"> ● Positions to be adjusted | <ul style="list-style-type: none"> ● VR521 (VPS LEVEL) |

Connection diagram

Color irregularity on the magenta screen is minimized.

Adjustment Procedure

1. Search for frame #8,000 on the test disc. (Magenta screen)
2. Adjust VR521 until the color irregularity on the magenta screen is minimized.

7. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

7.1 PDO137A(IC101)

● Mechanism control IC

Number	Pin Name	I/O	Pin Function
1	VCC	—	Power supply connection pin. Applies 5V $\pm$ 10%.
2	XCX	O	Analog audio CX noise reduction switching signal output pin. ON:L OFF:H
3	SQ1	O	Analog audio switching signal output pin. 1/L Squelch:H During digital audio, carried out by the control of the EFM decoder IC:CXD2500AQ.
4	SQ2	O	Analog audio switching signal output pin. 2/R Squelch:H
5	XANA	O	Digital/analog audio switching signal output pin. "H"=Digital "L"=Analog The signal output to the line-out and headphone is switched by this signal.
6	SLDR POS	I	Pickup position detection switch input pin (Analog signal). Divides the resistance of each switch, reads the value of the A/D input, and detects their positions.
7	FREQ DET	I	RF detection signal input pin (Analog signal). Inputs the RF detection output to A/D and uses it for the spindle rough servo. The voltage and frequency are in proportion.
8	SLDR ERR	I	Slider error signal input pin (Analog signal). A/D converts this signal and uses it as the control input of the slider servo.
9	TILT ERR	I	Tilt sensor output signal input pin (Analog signal). Inputs a signal which amplifies the output of the tilt sensor by 40 to 50 dB (0 to 5V) A/D converts this signal and uses it as the control input of the tilt servo. Controls the tilt motor so that this signal becomes 2.5V.
10	MUTE	O	Audio system audio mute control signal output pin. "H"=MUTE ON "L"=MUTE OFF
11	XREFV	I	Reference V-SYNC signal input pin for clear scan. Edge detection
12	SLDR DRV	O	Slider control signal output pin. Outputs the slider drive to PWM, and uses it for the slider servo. Period 910 usec, tertiary control H, L, Z
13	T OFF	O	Tracking operation control signal output pin Backs up the ON/OFF of the tracking servo operation with this signal. "H"=OFF "L"=ON
14	GFS	I	CD (EFM signal) frame lock signal input pin. Connected to Pin 12 of EFM decoder IC:CXD2500AQ "H"=Lock "L"=Unlock GFS are the initials of Good Frame Sync.
15	SI2	I	EFM decoder IC:CXD2500AQ sub-code input pin. Reads the sub-code with this signal and SCK2.
16	XLAT2	O	EFM decoder IC:CXD2500AQ control latch signal output pin. Transmits the control command using the SO3 and 2500CLK.
17	SCK2	O	EFM decoder IC:CXD2500AQ sub-code reading clock signal output pin. Generates the clock 98 times, and reads the sub-code.
18	TILT DRV	O	Tilt control signal output pin. PWM outputs the tilt drive and uses it for the tilt servo.
19	S – FTOM	I	Input pin of the data from the mode control IC. Serial front to mechanism. Used together with the data signal to the character generator IC.
20	S – MTOF	O	Mode control IC Serial data output to the mode control IC. Serial mechanism to front.
21	SCK1	I/O	Clock for serial communication with the mode control. Other than the communication with the mode control IC, it becomes the input mode.Used together with the clock signal to the character generator IC
22	TZC	I	Tracking error zero cross signal input pin. Compared signal of the tracking error signal. During track count search, counts this signal and controls the slider motor.
23	SCOR	I	Sub-code sync signal input pin. When this signal is "H", inputs the sub-code signal from the EFM decoder IC:CXD2500AQ as well. Monitors the playback condition of the disk according to the presence/absence of this signal.
24	T LATCH	O	D/A converter and digital filter IC:PD2026 serial control latch signal output pin.
25	SHAKE	I/O	Handshake signal pin for data communication with the mode control IC. This pin is the data line for both directions. Transmits the timing of the data transmission when the microprocessors switch the output/input mode.
26	XPBV	I	LD/CDV playback vertical sync signal input pin. This IC basically operates by synchronizing with this signal (Falling edge). Creates the timing of the jump according to this signal in the special playback mode of CAV. "L"=During vertical sync
27	CN VSS	—	GND for A/D conversion.
28	XRESET	I	Reset signal input pin. "L"=Reset "H"=Reset release Controlled by the mode controller
29	XTAL IN	I	9 MHz clock oscillation input pin.
30	XTAL OUT	O	9 MHz clock oscillation output pin.
31	N.C.	—	Not used.
32	VSS	—	GND

Number	Pin Name	I/O	Pin Function
33	SW1	I	Switch input pin for loading/tilt position detection.
34	SW2	I	Switch input pin for loading/tilt position detection.
35	SW3	I	Switch input pin for loading/tilt position detection.
36	N.C.	-	Not used.
37	FG	I	Spindle motor FG signal input pin. 24 times per rotation. Used by dividing frequency into 3 in the microprocessor.
38	DATA	I	Input pin for the Phillips cord decoder of the built-in mechanism controller.
39	XPBH	I	Playback H-SYNC input for decoding the Phillips cord.
40	XPBV	I	Playback V-SYNC input for decoding the Phillips cord.
41	CAV	O	CAV/CLV switching signal output pin. "H"=CAV "L"=CLV Connected to Pin 6 of PA5013 and used as a video NR switching signal.
42	SOFT	O	Image quality adjustment switching signal output pin. "H"=Soft "L"=Normal
43	ACC CONT	O	Acceleration and deceleration signal output pin of the spindle. H=Acceleration L=Deceleration Z=CD, stop, play
44	GPWM	O	Duty pulse signal output pin for the spindle gain switching. CLV internal circumference:L, External circumference:H CAV:L CDV:H
45	J.TRIG	O	Track jump signal output pin. For track 1 jump Start of jump:H Others:L Width of "H" is approximately 20 usec.
46	SCK3	O	Serial 3 clock signal output pin. Rising edge reading "H" period:2 usec "L" period:20 usec.
47	SO3	O	Serial 3 data signal output pin The serial signal is shared, and the latch signals(XLAT3, XLAT2, T LATCH) discriminate the signal. LSB first
48	XLATCH3	O	Latch signal output pin for the spindle servo IC.
49	CLV SCAN	O	CLV V sync scan mode signal output pin.
50	VSQ	O	Video output switching signal output pin. "H"=Squelch "L"=Video playback
51	VLOCK	I	Vertical sync lock detection signal input pin. For CLV clear scan, Constant time "H" when REF-V and PBV are in-phase
52	SENA	O	Shift enable signal output pin. For CLV clear scan, "H" when H is thinned out and REF-V and PBV are brought close together
53	XSPLOCK	I	Spindle lock signal input pin L:Lock H:Unlock
54	N.C.	-	Not used.
55	N.C.	-	Not used.
56	N.C.	-	Not used.
57	N.C.	-	Not used.
58	N.C.	-	Not used.
59	TRAY.SW	I	Switch input pin for CD direct tray position detection.
60	TURN A	I	α turn position detection signal input pin. "L"=Side A "H"=Side B, Turning
61	TURN B	I	α turn position detection signal input pin. "L"=Side B "H"=Side A, Turning
62	RFCORR	O	RF collection switching signal output pin. H=Gain-up Increases the gain in the CAV internal circumference. Frame #8000 to #8100
63	DIRECT	O	CD direct video system power supply OFF signal output pin. "H"=Video system power supply off, "L"=Normal
64	XFLOCK	I	Focus servo lock signal input pin Used for the lock detection of the focus servo. "L"=Lock "H"=Unlock

7.2 PDB070A (IC102)

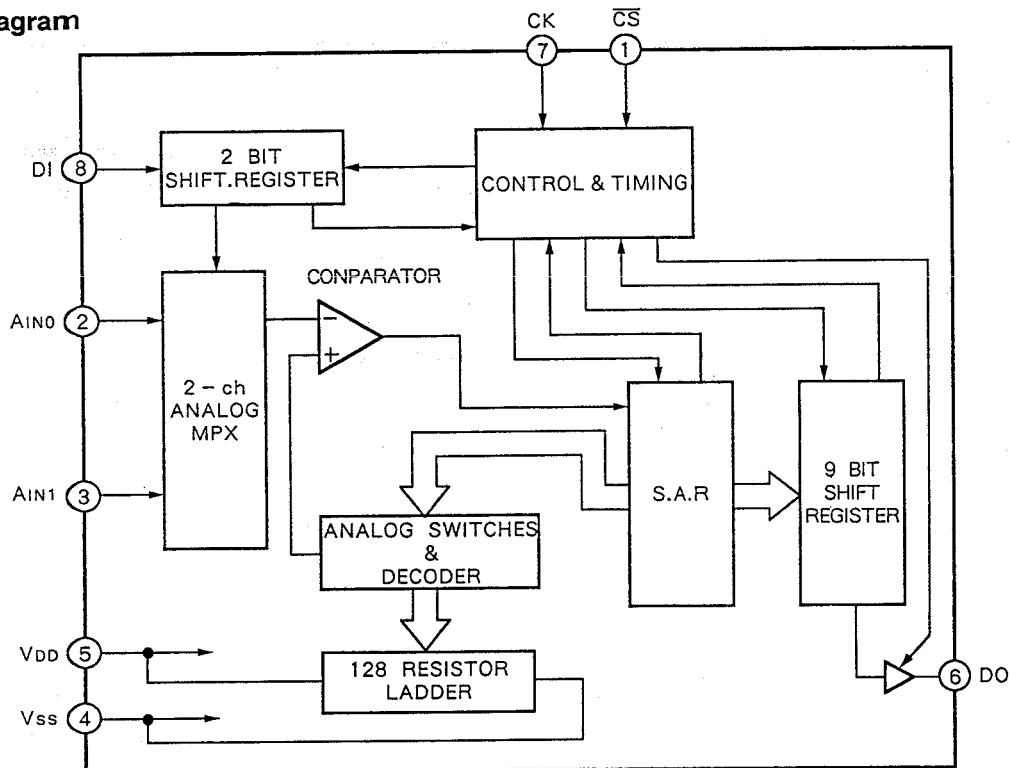
● Mode-control IC

No	Pin Name	I/O	Function	No	Pin Name	I/O	Function
1	V _{DD}	I	Power supply (5V)	33	DOOR OPEN	I	Door-switch input "H" for OPEN
2	(NC)			34	KAR/NOR	I	KARAOKE/NORMAL select switch input
3	G10	O	Fl lighting timing outputs "H" for ON and "L" for OFF	35	DSP	O	Select DSP output "L" for ON
4	G9			36	CS (DSP)	O	YSS205 (DSP) Select
5	G8			37	OEM	I	OEM select input. "L" for OEM set
6	G7			38	CS	O	PD0093 (display IC) Select
7	G6			39	RESETO	O	Reset output
8	G5			40	SCK	I/O	Serial data transfer clock
9	G4			41	SI	I	Serial data input
10	G3			42	SO	O	Serial data output
11	G2			43	RESETI	I	Reset input
12	G1			44	SEL IR	I	remote control input
13	(NC)			45	SHAKE	I	Serial-com start request input
14	MTONE2	O	Low booster for MIC input "L" for ON	46	MODE1	I	MIC control-1(keycon down) input
15	MTONE1	O	Hi booster for MIC input "L" for ON	47	MODE2	I	MIC control-2(keycon up) input
16	DOG FOOD	O	Timing output for the watchdog timer	48	ACK	O	Serial-com start acknowledge output
17	CS (A/D)	O	TC35097AP (A/D converter) Select	49	POWER	O	Power ON/OFF. "H" for ON "L" for OFF
18	V _{DISP}	I	Power supply(-30V) for the FL display	50	S-SCAN	O	Shuttle scan output. "H" for ON
19	a (KS0)	O	Fl lighting segment outputs "H" for ON and "L" for OFF Key scan outputs "H" for ON and "L" for OFF	51	INT/EXT	I	Internal/External source select inp
20	b (KS1)			52	(NC)		
21	c (KS2)			53	I/O DATA	O	Serial data output for BU2040F
22	d (KS3)			54	I/O CLK	O	Serial clock output for BU2040F
23	e (KS4)			55	MICSNS	I	"Sense MIC input" input. "H" for SENSE
24	f (KS5)			56	KINO	I	Key data input "H" for ON and "L" for OFF
25	g (KS6)			57	KIN1		
26	h (KS7)			58	KIN2		
27	i (KS8)			59	KIN3		
28	j (KS9)			60	X1		Not Used (GND)
29	k			61	X2		Not Used (No connection)
30	l			62	X _{SS}		Not Used (GND)
31	(NC)			63	OSC2	I	Oscillator (5.5 MHz)
32	(NC)			64	OCS1	O	

7.3 TC35097AP (IC101)

● 8-Bit 2ch serial I/O A/D converter

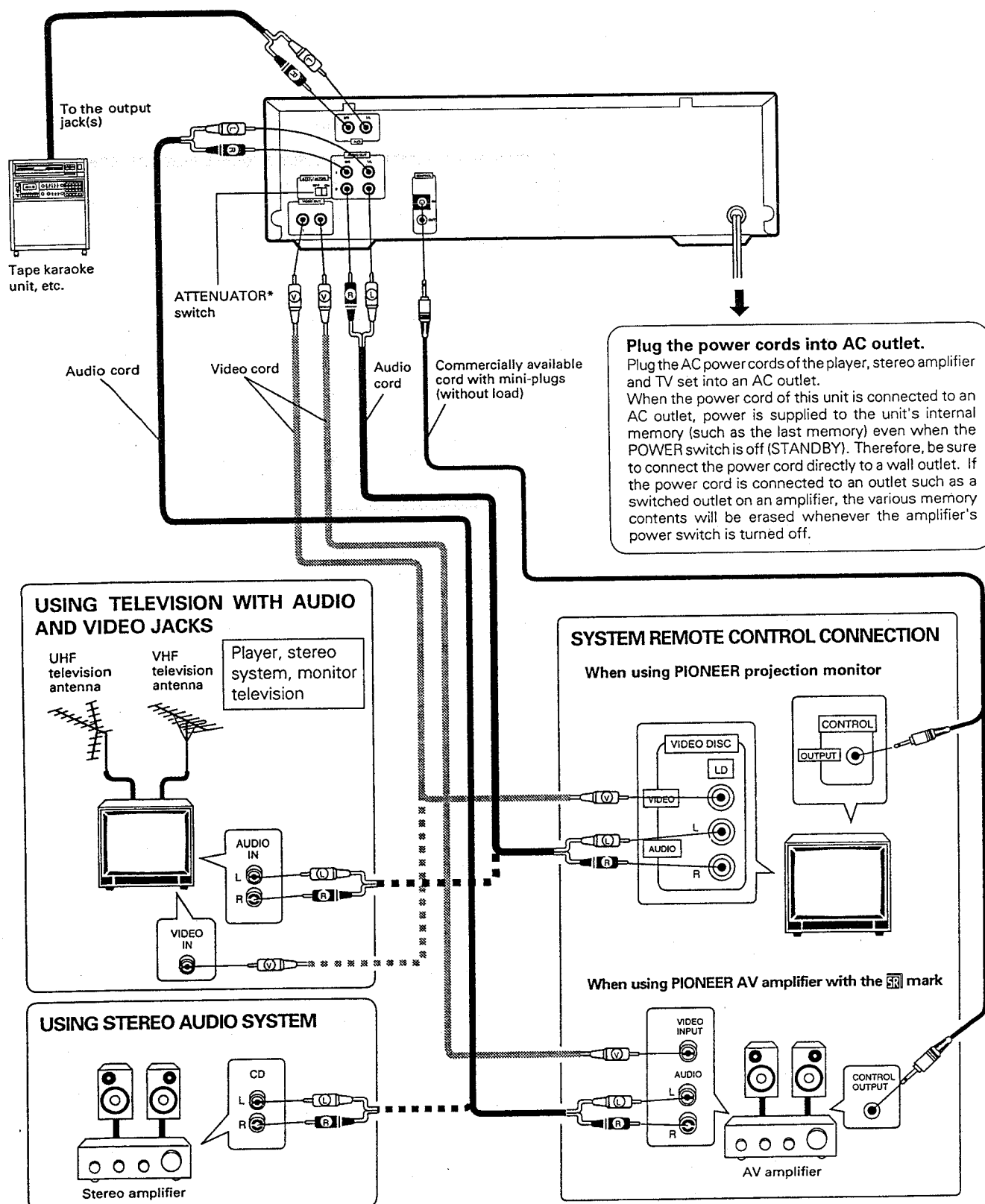
● System Diagram



● Pin Descriptions

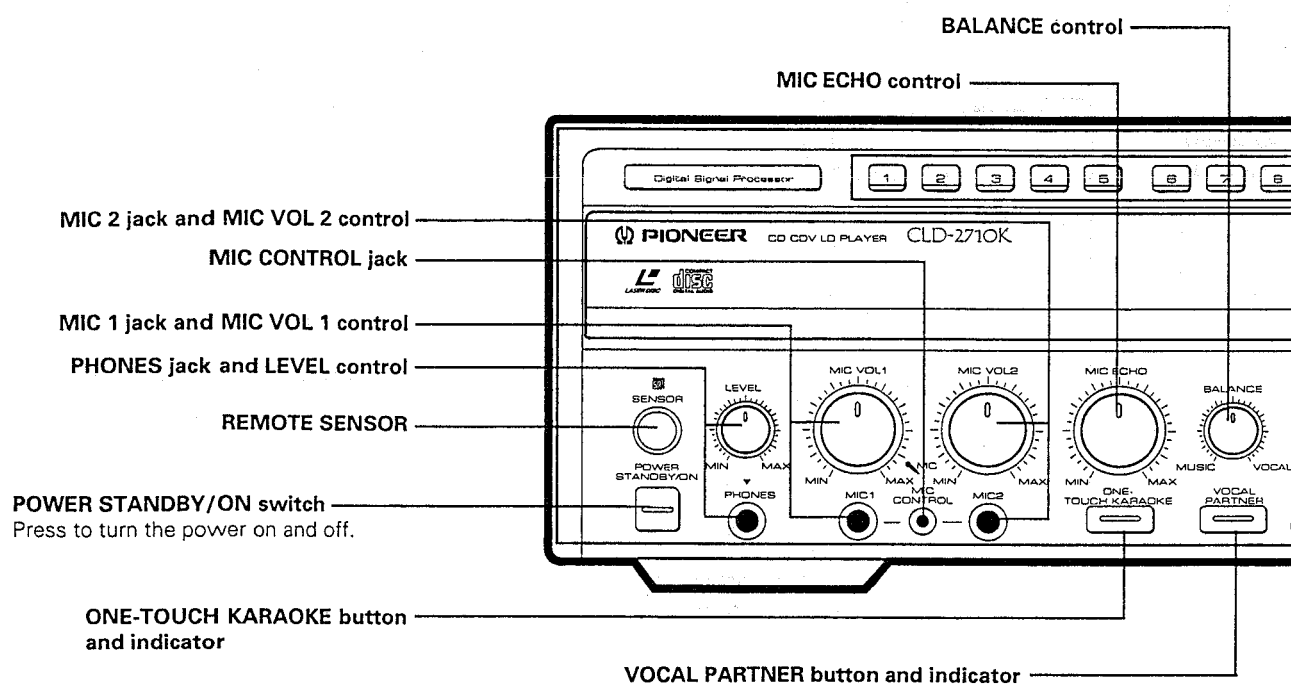
Pin No.	Symbol	Function						
1	$\overline{\text{CS}}$	[Chip Select] The conversion mode is set at the falling edge of $\overline{\text{CS}}$ and conversion begins. When adjusted to "H" the standby mode is set and all outputs become high impedance.						
2	AIN0	[Analog Input] Analog input pin. The input level of the AIN selected by the DI input is converted. The input range is VSS to VDD. <table><tr><th>On Channel</th><th>Serial Input CHS</th></tr><tr><td>AIN0</td><td>L</td></tr><tr><td>AIN1</td><td>H</td></tr></table>	On Channel	Serial Input CHS	AIN0	L	AIN1	H
On Channel	Serial Input CHS							
AIN0	L							
AIN1	H							
3	AIN1							
4	VSS	[Digital Ground] System ground pin. Normally 0.0V.						
5	VDD	[Power Supply] Power supply pin. 5.0V $\pm$ 10%.						
6	DO	[Data Output] Following the start bit "L" the conversion data are sequentially output in serial form from MSB.						
7	CK	[Clock Input] Reference clock input of the conversion operation.						
8	DI	[Data Input] Following the start bit "L" the serial data are input in the order of CHS.						

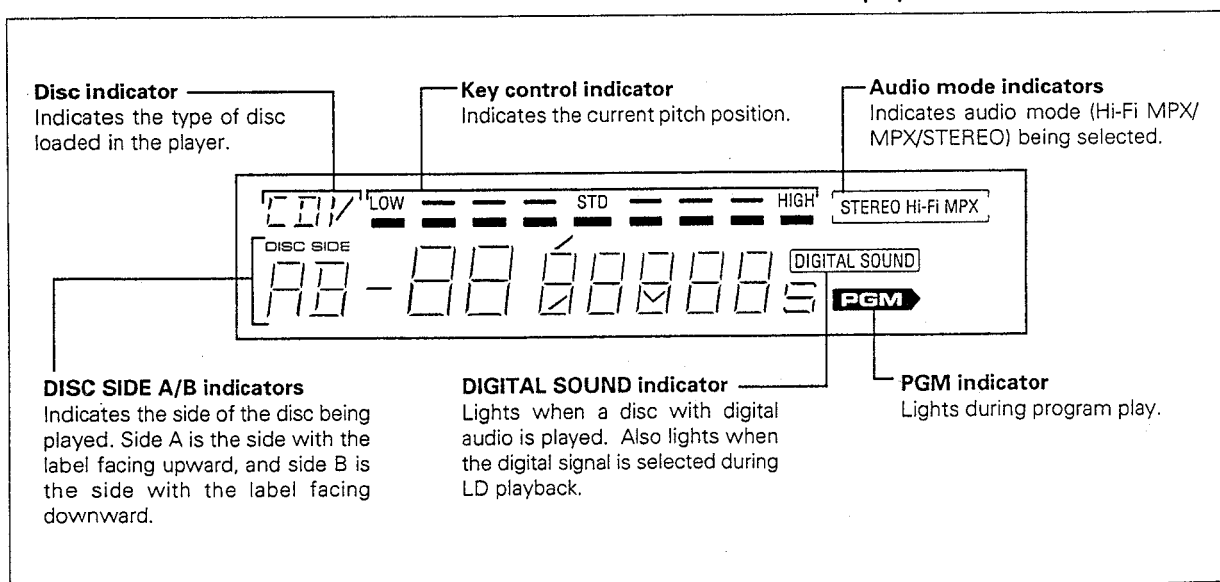
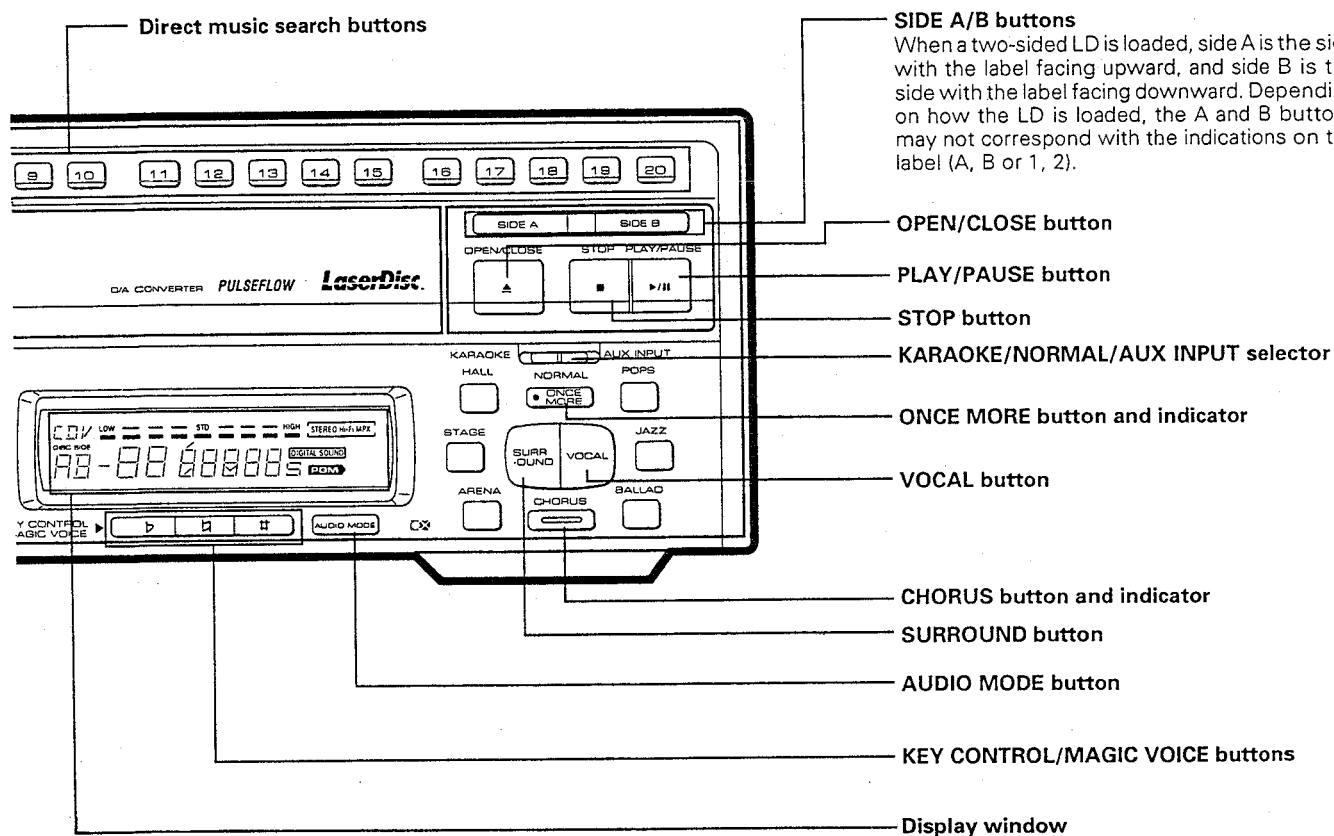
8. CONNECTIONS



9. PANEL FACILITIES

Most of the buttons on the front panel are used for Karaoke play.
A detailed description is provided on the indicated page(s).





10. SPECIFICATIONS

1. General

System	LaserVision Disc system and Compact Disc digital audio system
Laser	Semiconductor laser wavelength 780 nm
Power requirements	AC 110 - 127 V/220 - 240 V (Switchable), 50/60 Hz
Power consumption	39 W
Weight	8.8 kg (19 lbs 6 oz)
Dimensions	420 (W) x 441 (D) x 139 (H) mm 16-9/16 (W) x 17-3/8 (D) x 5-1/2 (H) in
Operating temperature	+5°C ~ +35°C (41°F - 95°F)
Operating humidity	5% ~ 90% (There should be no condensation of moisture.)

2. Disc

LaserVision Discs

*Maximum playing times

12-inch standard play disc	1 hour/both sides
12-inch extended play disc	2 hours/both sides
8-inch standard play disc	28 min/both sides 14 min/one side
8-inch extended play disc	40 min/both sides 20 min/one side

Spindle motor speed

Standard play disc	1,800 rpm
Extended play disc	1,800 rpm (inner circumference) to 600 rpm (outer circumference) (For a 12-inch disc)

Compact Discs

DISC	Diameter: 5-inch, 3-inch, Thickness: 1.2 mm
Rotation direction (pickup side)	Counterclockwise
Liner speed	1.2 ~ 1.4m/sec
*Maximum playing time	74 min. 5-inch discs 20 min. 3-inch discs (For stereo playback)

Compact Discs with Video

Disc	Diameter: 5-inch, Thickness: 1.2 mm
Rotation direction (pickup side)	Counterclockwise
Linear speed	Audio portion: 1.2 ~ 1.4m/sec Video portion: 11 ~ 12m/sec
*Maximum playing time	Video portion: 5 min. (CLV) Audio portion: 20 min. (Digital)

* Actual playback time differs for each disc.

3. Video characteristics (two pairs)

Format	NTSC specifications
Video output	
Level	1 Vp-p nominal, sync. negative, terminated
Impedance	75Ω unbalanced
Jack	RCA jack

4. Audio characteristics (two pairs)

Output level	
During analog audio output	200 mVrms (1 kHz, 40%)
During digital audio output	200 mVrms (1 kHz, -20 dB)
Jacks	Both RCA jacks
Number of channels	2

5. Other Terminals

Microphone input	2
MIC control input	miniature jack
Head phones output	1
Control input/output	Both miniature jacks
AUX	RCA jacks

6. Accessories

Remote control unit (CU-CLD047)	1
Size "AAA" (IEC R03) dry cell batteries	2
Video cord	1
Audio cord	1
Operating instructions	1
Warranty card	1

7. Functions

Remote control unit operations (CU-CLD047)

	Function	Standard play Disc (CAV)	Extended play Disc (CLV)	Compact Disc with Video	Compact Disc
Basic Functions	Two-side play	YES	YES	NO	NO
	Single-side play	YES	YES	YES	YES
	Pause	YES	YES	YES	YES
	Stop	YES	YES	YES	YES
	Eject	YES	YES	YES	YES
Search	Fast forward (forward and reverse)	YES	YES	YES	YES
	Chapter/Track skip	YES	YES	YES	YES
	Direct chapter/Track number search	YES	YES	YES	YES
	Frame number search	YES	NO	NO	NO
	Time number search	NO	YES	YES	YES
	Absolute time search	NO	NO	NO	YES
Program	Chapter/Track program play	YES	YES	YES	YES
	Program correction	YES	YES	YES	YES
Repeat	Chapter/Track repeat	YES	YES	YES	YES
	One-side repeat	YES	YES	YES	YES
	Two-side repeat	YES	YES	NO	NO
	Program repeat	YES	YES	YES	YES
Trick play	Still/Step	YES	NO	NO	NO
Time display	Elapsed time display	NO	YES	YES	YES
	Absolute time display	YES* ¹	NO	NO	YES
	Remaining track time display	NO	NO	YES	YES
	Remaining total time display	YES* ¹	YES* ¹	YES	YES
	Total number of selections, total time display	YES* ¹	YES* ¹	YES	YES
Others	CX system ON/OFF	YES* ²	YES* ²	NO	NO
	AUTO DIGITAL/ANALOG switch	YES* ³	YES* ³	NO	NO
	Audio channel selection (Stereo, 1/L, 2/R)* ⁴	YES	YES	YES	YES

*¹ Only discs with TOC

*² Valid for analog audio playing a disc with the  mark.

*³ Can only be used with discs with digital audio tracks.

*⁴ Only NORMAL mode

NOTE:

The specifications and design of this product are subject to change without notice, due to improvement.